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SIDENTIAL AIR CONDITIONING . WARM AIR HEATING . SHEET MITAL CONTRACTING

Sheet Metal is Vital

AGE 69 . 97 . 109



Air Controls New FLOOR REGISTERS AND FACES with UNI-GRID CONSTRUCTION*

UNI-GRID CONSTRUCTION FOR GREATER STRENGTH AND BETTER STYLING

Air Control's new UNI-GRID CONSTRUCTION gives a Floor Face of one-piece construction, far stronger than the conventional face — the Face has no seams in the corners and lies flat on the floor!

Full depth grids have additional support from heavy steel supports that are anchored to angle section — welded to margin and resting on floor.

Massive frets, flush with the margin, give a rugged appearance.

Floor Face is heel proof and has ample free area for all standard pipe sizes.

The new dial operated valve rolls open with a touch of the foot. Heavy gauge embossed valves running the short way of the face result in exceptional strength and rigidity. There is no friction of metal on metal and valve will not "gum" with paint or stick when hot.



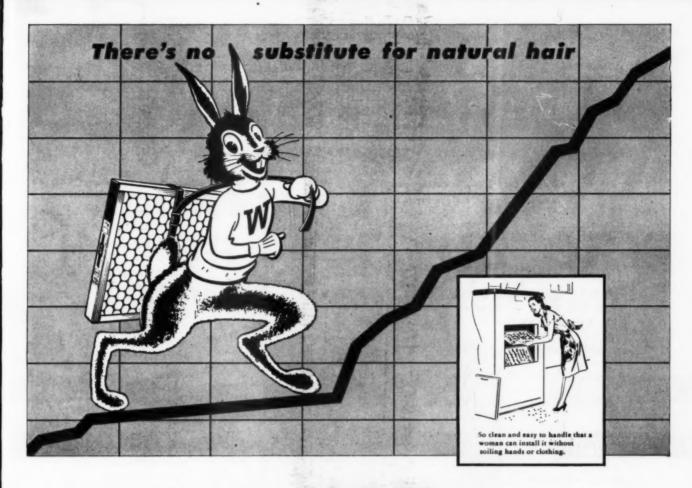
See this truly outstanding line of Floor Goods at your Jobbers!

Write 70day for Air Control's new 48 Catalog showing the complete line of Registers, Grilles, Diffusers and Accessories.

AIR CONTROL PRODUCTS, Inc.

COOPERSVILLE

MICHIGAN



IT'S THE HAIR — that's carrying Wilson's Filter sales up and up

Build a better air filter and the world will make a beaten path to your door. Emerson said Mouse-Trap. We say air-filter because that's what is happening to Wilson's HAIR Filters. They are better filters according to users (see below). The exclusive bair filtering media plus Wilson's double-filtering action does a better job—keeps the air cleaner—saves redecorating expense. And as the word gets around, people are making a "beaten path" to our dealers' doors. The result is that Wilson's HAIR Filter sales are going up and UP.

Read what this user says:

"We have been using Wilson's HAIR Filters for the past four years and find that of all the different filters we have tried, yours have given the best service . . . they only need replacing once a year and for the last four years our spring cleaning has been at a minimum."

Ride along with a winner.

Send for FREE sample with details and prices.

Wilson & Co., Inc. (Air Filter Division) 4100 S. Ashland Ave., Chicago, III.

Western States Representatives: Harold Winningham & Company • Seattle • San Francisco Los Angeles • Denver • Salt Lake City • El Paso





WILSON'S

AIR FILTER

WILSON & CO.

RESIDENTIAL AIR CONDITIONING . WARM AIR HEATING . SHEET METAL CONTRACTING

Member-Audit Bureau of Circulations Member-Associated Business Papers

MANAGEMENT SECTION OUR INDUSTRY MUST HAVE SHEETS

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Merged with American Artisan are "Warm Air Heating" and "Furnaces and Sheet Metals"

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Published monthly by Keeney Publishing Company, 6 N. Michigan Ave., Chicago 2, Ill., U.S.A. Copyright 1948 by Keeney Publishing Company

> Publisher-FRANK P. KEENEY Manager-Charles E. PRICE Production Manager-L. A. Dovle

Yearly Subscription Price-U.S. and possessions, \$3.00; Canada, Cuba, Mexico, South America, Central America, \$4.00; Others, \$6.00. Single copies, U. S. and possessions, \$.35. Back numbers, \$.60. January, 1948, Directory Issue, \$1.50 per copy. Entered as second-class matter, July 29, 1932, at the post office at Chicago, Illinois, under the Act of March 3, 1879. Additional entry at Milwaukee, Wisconsin.

Founded 1880

SEPTEMBER, 1948

Volume 117, No. 9

AMERICAN ARTISAN, September, 1948

Syncromatic scores a FIRST! IN FURNACE HISTORY A NEW Super-Styled UNIT

OR COAL

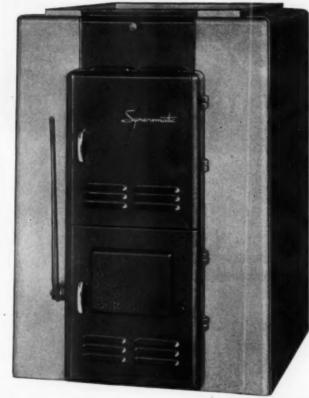
AN EFFICIENT
COAL - FIRED UNIT
THAT CAN BE CONVERTED TO AN EFFICIENT OIL-FIRED UNIT





HI-BOY GAS UNITS
2-Sizes
75,000 and 100,000 B.T.U.
rear or bottom return

8





OFB OIL-FIRED SERIES 5-Sizes 90,000 to 250,000 B.T.U.



GFB GAS-FIRED Basement Models 4-Sizes 120,000 to 240,000 B.T.U.

GRAVITY OR FORCED AIR

Syncromatic
HAS THE GROUND FIT
DOORS COMBINED
WITH VENTILATED
STEEL CABINET SHIELD
WHICH NOT ONLY
INSULATES AND
COOLS DOORS BUT
IN CREASES
EFFICIENCY
AS WELL



OFB-621 HI-BOY OIL-FIRED Gun-Type Burner 85,000 B.T.U.

Syncromatic Corporation
WATERTOWN, WISCONSIN



Magnesium Ladders and Boats

I read the article entitled Magnesium—A Modern Marvel, by R. C. Nason, in the July issue of American Artisan and wish to ask if magnesium extension ladders are being made and where they may be purchased.

R. R. RICHMOND Terre Haute, Ind.

We thank you for your letter stating that one of your readers inquired where extension ladders may be bought. If you will send us his name and address, we will be pleased to furnish the information.

J. A. COLLAT White Aircraft Corporation Palmer, Mass.

White Aircraft Corporation:

I will appreciate your sending me a catalog and prices on your magnesium boats.

PAUL R. HOBSON Marsh Steel Corporation North Kansas City, Mo.

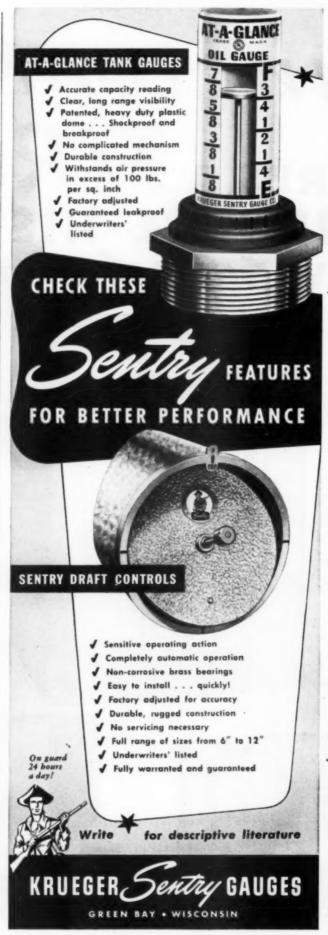
We enclose letter (above) from Marsh Steel Corporation, which is typical of other letters we have received.

Will you kindly publish in your magazine that we do not manufacture boats and that information about magnesium boats can be obtained from the Dow Chemical Company?

Will you kindly reply to the enclosed letter?

J. A. COLLAT White Aircraft Corporation.

The Dow Chemical Company, Midland, Michigan, has magnesium boats in stock. These were produced in conjunction with its magnesium development program and it is anticipated that in the im-





mediate future several manufacturers will go into full production of a number of magnesium products.

The White Aircraft Corporation is now making magnesium ladders and full particulars may be had by addressing that company.—Ed.

P.S. All this seems to indicate that many of our readers must be fishermen. Tight lines to you!

Chimney Furnace

Within recent months you published a new product item of a chimney recirculating furnace.

Can you supply us with the manufacturer's name?

ELDEN L. HAUCK Hauck Brothers Springfield, Ohio.

Base Pricing

Chairman Capehart (Indiana) of the Senate Committee on Trade Relations has appointed an advisory council of 41 members to study effects from the Supreme Court's decision on base point pricing.

"Not only are businessmen confused," said Senator Capehart, "but so also are economists, lawvers, and financial writers. The committee purpose is to start out with a free and open mind to ascertain what pricing policies are for the best interests of the whole nation."

The court decision prohibits absorption of freight costs by producers as a means of meeting competition with plants located nearer to the customer

Congressional clarification of the whole issue is expected when the new Congress meets next January.



AMERICAN ARTISAN, September, 1948

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Fire Prevention

To save lives and resources from fire, one of the most extensive nation-wide advertising campaigns vet undertaken by the National Board of Fire Underwriters has been launched this summer. The campaign will bring the menace of fire forcefully to the attention of millions of people.

Dramatic illustrations will dominate this fall's Fire Prevention Week poster and other safety literature. Fire Prevention Week this year is October

Fire losses in June this year amounted to nearly \$54 million and for the 12 month period ending June 30, to a record breaking \$709 million. the greatest destruction ever recorded in a 12 month period in United States history.

For the first six months of 1948, fire waste totaled over \$386 million, which exceeds by several million the fire loss for the entire year of 1943. The 1943 loss was a little over \$235 million.

Short-Cut for Nuts

It generally takes about five years for a tree to produce nuts. An ambitious tree could get short-cut pointers in this regard from some so-called liberal youth organizations.

Evaporative Cooling

The Wall Street Journal:

I read with interest and surprise your recent article on air conditioning. One thing you can be congratulated for was the extremely lopsided nature of your article. I do not know whether this was due to the refrigeration people writing your copy or gross ignorance



PRODUCT OUALITY

Vitroliner, the acid resisting vitreous enamel chimney liner is designed to withstand all the harmful and destructive properties created by products of combustion. Manufactured from heavy gauge, high quality iron, coated inside and out with special acid-resisting vitreous enamel.

Reduces Fuel Consumption

Vitroliner increases the efficiency of the chimney by creating better draft conditions for the heating unit. This in turn helps to effect greater heating results.

VITROLINER-a pioneer in the field of lining chimneys-with many years of engineering development and research—is successfully safeguarding and protecting the most vital part of the house-the chimney.

Recommended by many gas companies and leading manufacturers of oil and coal burning equipment. Write our engineering department to help you solve any difficult and unusual venting problems.

Vitroliner Assures Longer Life for Chimney

Sold through and to Aggressive Johhers, Con-tractors and Dealers. Write for Further In-formation or name of our distributor in your territory.

CONDENSATION ENGINEERING CORPORATION 122 South Michigan Avenue, . Chicago 3, Illinois MFRS. OF VITREOUS ENAMELED PIPE FOR 20 YEARS



and crass stupidity upon the part of your writer.

Did you ever hear of evaporative cooling? Did you ever hear of the responsible concerns that make this type of equipment? If not, may I enlighten you to the fact that the combined sales of a number of representative concerns exceed \$25 million a year? This is factory value and does not include installation which you include in the figures you cite for refrigeration.

Numerically, I will hazard a guess that there are one hundred evaporative coolers installed for each refrigerative type of job.

Representative examples of evaporative cooling installations are the Naval Ordnance Test Station, Inyokern, California, with about 5,000 evaporative coolers, and practically every army air field in the western part of the country.

In addition to the manufacturers, there are hundreds of smaller concerns who are dependent upon the evaporative cooling industry for outlets of replacement parts.

Regretting that you have covered the subject so poorly, I am

DAN MOREY Los Angeles, Calif.

Stop Fires

Inspection blanks, advertising mats, posters, booklets, and mailing leaflets for use in conjunction with Fire Prevention Week, October 3-9 may be obtained from the National Board of Fire Underwriters.

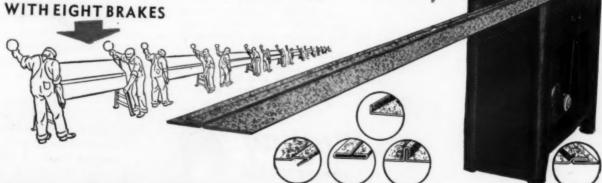
A letter addressed to the board, 85 John Street, New York 7, asking for fire prevention supplies will bring a complete list of the material.

A LOCKFORMER MAKES MONEY FOR YOU MAKES MONEY F

- does the job faster lets you handle more work (at no increase in overhead) . . .
- does the job better precise uniformity of seams and smooth "factory-made" appearance builds your reputation as a quality shop . . .
- Profit for you on every job!

SEND FOR THE NEW LOCKFORMER CIRCULAR

ONE MAN WITH A LOCKFORMER CAN MAKE MORE PITTSBURGH LOCKS THAN SIXTEEN MEN WITH EIGHT BRAKES



THE LOCKFORMER CO.

4615 W. ROOSEVELT ROAD

CHICAGO 50, ILLINOIS

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Duct Board Sags

We would like some information on two matters on which we believe you can readily advise us.

First, can you tell us if there is any duct board that will stand up under moist basement conditions? We have been using a board that sags losing its stiffness under this condition. Have you any suggestions?

Second, is there any ventilator made that can be put in below a window and that will close itself when rain blows into it so the owner can safely leave it open while he is away?

We are subscribers and appreciative readers of American Artisan.

A. B. CLARK

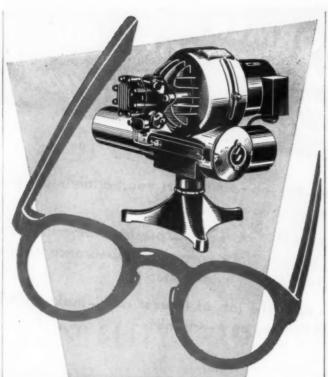
Clark Brothers Albia, Iowa.

Inquiry about the application of duct board for return air sheeting indicates there are two specifications which should be observed, especially when this material is applied under excessively moist basement conditions.

First, the board should be nailed every six inches to provide supporting strength and a tight fit along the bottom of the joists. When spanning two joist spaces, the six inch nailing applies to the three joists. This frequent nailing prevents moist basement air and dust from reaching the top surface of the sheet.

Second, the ends of the sheets should either be taped or joined with an S cleat. This prevents basement air from getting into the interior of the sheet through the ends.

Evidently your inquiry about ventilators below win-



Magic Glasses

THAT LOOK BACK OVER 27 YEARS

If you had a pair of glasses that would look back 27 years it would certainly be magic indeed. Let's suppose we do. Put them on. Let's look back at 27 years of automatic oil heating. We see 1921 and the first oil burner—clumsy looking, isn't it? We notice the changes through the years. Exterior design has gradually become compact and neat.

Of course our magic glasses can see inside the burner, too. There's the air diffuser. Nozzle position is adjustable. Motor protector has been added and the combustion chamber has been changed to the flame form. All these things are generally considered standard on quality burners today. And all these things were originated by Nu-Way engineers.

As we look now to 1948 we see that Positive Air Controls and Nozzle Shields have been added by Nu-Way engineers as exclusive features.

Can our glasses look into the future? Yes, and we see continued progress with Nu-Way continuing in its role as a leader in the development of even better automatic heating equipment.

CORPORATION
Rock Island, Illinois



Serving distributors, furnace and boller manufacturers Automatic Oil Heat Exclusively Since 1921



dows is prompted by the need for ventilation in rooms with large fixed windows-as in a solar house. These have been constructed of wood and have been installed during construction. The opening for the ventilator is part of the window frame construction. Wood louvers are installed in the opening and pitched down to shed rain similar to those made of metal and commonly fabricated in sheet metal shops. On the inside an insulated door. hinged on the bottom, permits the occupant to open the ventilator whenever ventilation is required. Since the arrangement is weatherproof, the occupant need not be concerned about its being open and closes it when desired.-ED.

Featherbedding

Last month the National Labor Relations Board approved an agreement entered into by the representatives of a plastering and cement finishers union, a building contractor, and the General Counsel of NLRB and thus ordered the union to reimburse the contractor for work not performed. The approved agreement was entered into after the contractor had filed charges and a formal complaint against the union had been issued.

The Government's complaint alleged that the union had demanded that four men be permitted to work when only two were required, and that it had demanded and received from the company compensation for six men at overtime rate of pay for work actually performed by two men.



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Golf Fitting

I recently completed an unusual fitting that may be of interest to other readers.

This fitting is to be used as a hazard on a miniature golf course. The ball can enter through either of two 8 in. by 10 in. openings and after making a complete loop, the ball



comes out at the back of the fitting. In elevation, the fitting makes a complete circle. It was made of 26 ga. galvanized steel and laid out so Pittsburgh lock seams could be used.

I have been a subscriber to your magazine and find it most helpful. I do general sheet metal work and would appreciate some articles on kitchen equipment.

Victory Tinsmith Supplies
Brooklyn, N. Y.

Disinfectant

Please send me the names and addresses of all manufacturers of germicidal glycol humidifiers for use with winter air conditioning systems.

S. F. BAKER

Laconia, N. H.

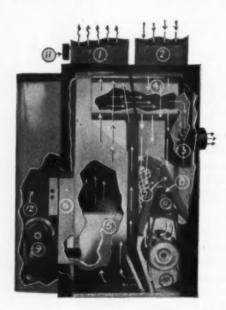
Your Local Market

Last month in his article, Measure Your Market, David Markstein listed several sources



Quality and Beauty

AT LOW COST!



5 Sizes Counter-Flo Basement Type 66,000 to 200,000 Btu.

2 Sizes Utility Type Hi-Boys 85,000 and 100,000 Btu.

One Gravity Furnace-76,500 Btu.

A SIZE and TYPE for EACH HOME NATION-WIDE DISTRIBUTION

Write-

J. V. PATTEN COMPANY

Sycamore, Illinois



for accumulating data for a local market survey. Readers who are interested in this subject may obtain further suggestions from recent handbooks issued by the Chamber of Commerce of the United States.

One is entitled How to Make a Local Area Trade Survey (50 cents), and the other, How Can You Get the Facts About Your Market? (10 cents).

The first, the more comprehensive one, deals with many of the special research problems encountered by chambers of commerce and other local groups of distributors. Much of the material included is also of interest to firms which sell and advertise on a national scale.

Among the subjects covered are the usefulness of local trade surveys, costs, outlining a trading area, determining potential sales, compiling actual sales by place of purchase, rural farm buying, institutional and trade buying, and tourist business.

The other booklet, the shorter of the two, is designed for use by proprietors of smaller retail, wholesale, and service firms. It shows at a glance which important facts to get and where to get them.

Although it can be read in a few minutes, more time is involved in gathering the figures as suggested. Contractors who assemble and arrange the data will be rewarded with a fund of knowledge about their own business that will be highly useful in planning.

Single copies are available on request to the Domestic Distribution Department of the chamber, Washington 6, D. C. FINAL TOUCH---for Perfect
Warm Air Heating The



MORE SALES MORE SATISFIED **CUSTOMERS**

At a cost within the reach of the average home owner you can now offer a control that will end drafts-hot and cold "layers" of air-"cold 70". On new installations or jobs already installed, it makes a more satisfied user of forced air heating.









-blower starts owing down.



It starts the motor at a plenum temperature of 100° and gradually increases the speed of the blower as the plenum temperature rises until it reaches 125°. The speed of the plower as the pienum temperature rises until it reaches 125. The blower operates at full speed until the plenum temperature drops below 125° at which point it gradually decreases speed as the plenum temperature drops.

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SPRING RETURN HEAT REGULATORS



This thermostat is designed for two-wire operation and is regularly furnished in an ivory colored plastic case. It has a sensitive bimetal blade, magnetic snap-action and shield to protect the contacts from dust.

Type A 12 Thermostot



This is a deluxe model of a damper motor with many new features. It operates to two positions. When the thermostat is satisfied or the electrical power fails the motor is immediately returned to the CLOSED or OFF position by a heavy internal spring built right into the motor.

THE WHITE MANUFACTURING CO.

2368 University Ave.

Saint Paul, Minnesota



NEW

The insta

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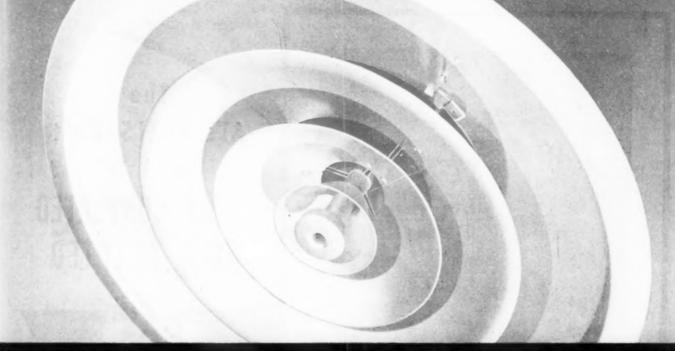
Emp heat may seaso mech horis patte Quic syste Auto mad



ANEMOSTAT PRESENTS THE

NEW Universal AIR DIFFUSER

TYPE C-1



NEW ASSEMBLY METHOD SAVES TWO-THIRDS OF INSTALLATION TIME







The new Type C-1 Universal Anemostat is very easy to install. All you do is place the unit on the floor, press the spring lock button located on the outer cone, twist the inner cone assembly slightly and lift it out. Then

fasten the outer cone to the supply duct and replace the inner cone assembly, give it a clockwise twist . . . snap . . . the new C-1 Anemostat is completely installed. No bolts, no tools, no fiddling, no lost motion.

OTHER IMPORTANT FEATURES!

Employs basic Anemostat Aspiration principle. • Designed for heating, ventilating, cooling... in any combination. Adjustment may be varied to meet changing conditions of room occupancy, seasonal weather variations or special conditions. • Unique control mechanism provides any desired air flow pattern from draftless horizontal air diffusion in cooling to an intermediate downward pattern in ventilating or to downward projection in heating. • Quick removable inner cone assembly saves time in balancing the system, permits direct CFM readings to be taken in the neck. • Automatic or manual remote controls available. • Provision is made for incorporating volume control or lighting fixtures.

WRITE FOR BULLETIN which fully describes the new Type C-1 Anemostat . . . an unusually versatile device.

ANEMOSTAT

DRAFTLESS AIR-DIFFUSERS

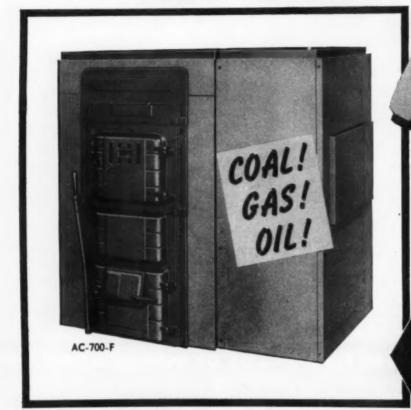
ANEMOSTAT CORPORATION OF AMERICA

10 EAST 39th STREET, NEW YORK 16, N. Y.

REPRESENTATIVES IN PRINCIPAL CITIES

"No air conditioning system is better than its air distribution"

MONCRIEF'S "HEATOMATIC" Air Conditioning Unit is the BIG NEWS in the Heating Market



The
ALL FUELS Unit
that is
EASILY CONVERTED
WELL ADAPTED

for GAS OIL



• Here's the coal-fired air conditioning unit that can be readily converted at any time, even after installation, to burn oil, gas, or for stoker firing, because...

The excellent design and construction of the rugged steel heating element, with long fire travel and large heating surface, provide the necessary qualifications for the versatility of this unit.

A new cabinet that allows the full height blower compartment to be assembled at either side, is finished in smooth, glossy baked enamel.

An automatic humidifier supplies the necessary moisture.



Series W Gas-Fired, Steel



Series U Gas-Fired, Stee Utility Air Conditioning Unit



Series CL Gas-Fired, Cas Iron Air Conditioning Unit



Series P
Oil Fired, Steel
Air Conditioning



Series VU Oil Fired, Steel Utility Air Conditioning Un



Series 700 Coal-Fired, Stee



Series C Coal-Fired, Cas Gravity Furnaci

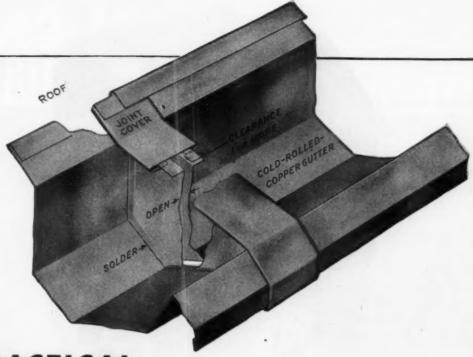
THE HENRY FURNACE COMPANY

Medina, Ohio

HEATING AND AIR CONDITIONING UNITS



FURNACE PIPE AND FITTINGS



A PRACTICAL EXPANSION JOINT to Prevent Buckling in Built-in Copper Gutters

PROVISION FOR EXPANSION is an important factor in assuring trouble-free service from sheet copper built-in or box gutters. The expansion joint illustrated requires a minimum of material and labor. Properly installed, it is leakproof, yet provides fully for maximum lengthwise movement.

In effect this joint is made by cutting the gutter in two and building a header into the end of each half, allowing a suitable clearance between headers and making the joint weather-tight with a sleeve type joint cover.

The copper headers are fastened to the gutter by means of simple soldered lap seam joints. The expansion joint is placed midway between the downspouts. The space between headers in the joint should be calculated at the rate of one-fiftieth inch per linear foot of gutter with a minimum dimension of one inch.

Cold-rolled cornice temper copper is to be preferred for all built-in gutter work. For further information, write for Anaconda Publication C-3, SA.

Anaconda

THE AMERICAN BRASS COMPANY

General Offices: Waterbury 88, Connecticut
Kenosha Branch: 1420 Sixty-third Street
Chicago Warehouse: 1326 West Washington Blvd. 7
Milwaukee Warehouse: 1033 W. Bruce Street 4



Unit shown is Mueller Climatrol Type 202 Oil-fired Winter Air-Conditioner (convertible to Type 106 Gasfired Winter Air-Conditioner)

A Fuel-Thritty

Mueller Climatrol Furnace serves your customers right

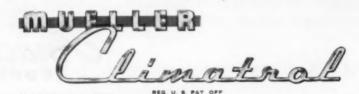
-with heating economy that helps you sell

Fuel economy sells furnaces for you today. And Mueller Climatrol gives you a fuel-saving story that's hard to beat. That's the story to tell. That's the story that sells, with fuel costs high and fuel supplies low.

You can prove this story to your customers! Show them the complete Mueller Climatrol line, for gas, for oil, for coal. Show them the unique burner and heat-exchanger design features that protect them against waste-high fuel bills. Explain how each furnace is scientifically engineered to serve them faithfully for years of comfort and health protection. Tell them how important it is to select a furnace backed by Mueller's more than 91 years of specialized experience.

Yes, that's a strong competitive story that gets business for you. It sells your new-home customers. It keeps them from buying a "bargain" furnace that cannot give them the years of satisfying service you offer. And it sells your many prospects who are trying to make obsolete furnaces last a little longer. You can help them avoid the premium of high fuel bills by installing a Mueller Climatrol now. And now is the time to act, before the heating season begins.

Write for latest literature on the Mueller line — and start cashing in on Mueller Climatrol's economy appeal at once. . . . L. J. Mueller Furnace Company, 2010 West Oklahoma Avenue, Milwaukee 7, Wisconsin.



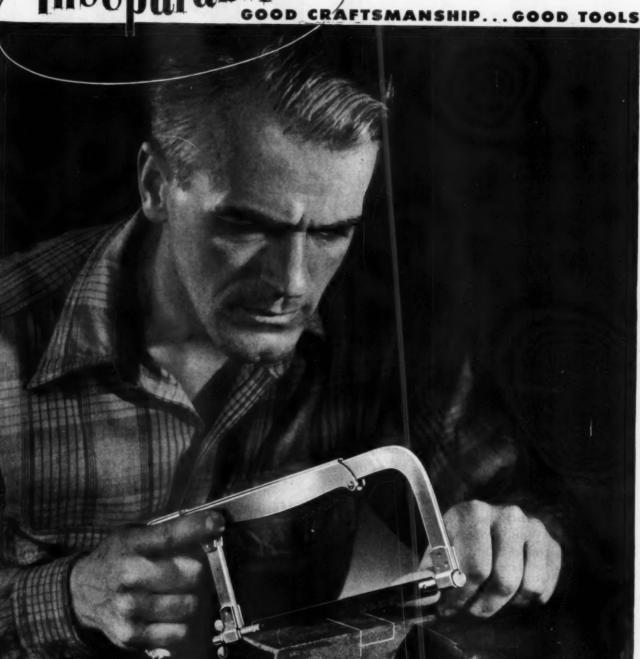
D-89

FOR GAS

FOR OIL

FOR COAL

Inseparable.



"CRESCENT" is our trade-mark registered in the United States and foreign countries for wrenches and other tools. "Crescent" tools are made only by Crescent Tool Company of Jamestown, N. Y., and are sold by leading distributors everywhere.

CRESCENT TOOLS

Sign of the Artisan Symbol of Excellence



(1) New Improved, Long-Life, Cast-Iron Heat Exchanger. Provides easier removal of top plate flue gas collector and new interior suspended alloy steel turbulators.

(2) Twin Air-Flow Ventilating Louvres. Admit a direct flow of ventilating air to assure the cool operation of all controls.

- (3) New Type Ribbon Burners. New design, features a quickly removable, steel burner chassis. Burner ribbons are nested in an open top holder for easy removal. Burners suitable for all gases including L P.
- (4) New, Plug-in, Self-Positioning Electrically Operated Pilot. Plugs into regular type electrical outlet, can be removed in seconds. New actuating lever and switch design assure long-life positive operation.
- (5) Combination Fan and Limit Control. Switch mechanism and thermal element are factory set in the most convenient and accessible location.

INCORPORATING TIME-PROVEN DESIGN PRINCIPLES

(6) Standard Dimensions, All Parts and Controls Completely Enclosed. All six sizes are a standard 26" in depth, and 60" high, only the width changes. All units are crated, easily moved through standard size door.

(7) Large Capacity Blowers. Rubber cushioned blower chassis support cradles the blower, absorbs all vibration, results in quiet operation.

(8) Over-Size Filters. Double filter suspension assures clean circulated air at all times.

(9) Accessible Control Assembly. All units of the control and burner assembly are compact. Can be inspected and serviced by removing upper front cabinet panel.

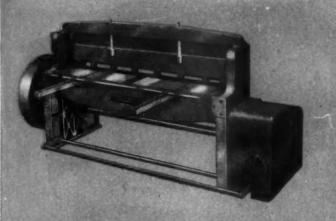
(10) Duct Mounted Humidifier. Shipped separately. Usually located in the supply duct near the Conditioner after installation.

(11) C-A-C Operation. All units can be factory adjusted for continuous air circulation operation.

(12) Smart Styling. The New Janitrol looks different it is different.

Your Janitrol representative has complete Specification and Performance plete on this new Winter Air Condata on this new Winter Air Conditioner. He can supply any ditioner. He can supply any information you may require.

SURFACE COMBUSTION CORPORATION - TOLEDO 1, OHIO





POWER SQUARING SHEARS in 8 Foot, 10 and 12 Gauge, 6 Foot, 10, 12 and 14 Gauge, and 52 inch 12 Gauge capacities.

Wysong and Miles Sheet Metal Machines are Economical and Productive

For time-saving precision features that assure quality work and more production, specify Wysong and Miles Sheet Metal Machinery. Finely engineered for long and dependable performance... more and more shops everywhere are turning to Wysong and Miles for sheet metal shearing and bending equipment.

A precision ball-bearing parallel back gauge, adjustable to .0078 (1/128th) of an inch is available for all POWER SQUARING SHEARS. The larger Power Shears have a non-repeat unit that can be set to stop shearing action after each cycle; a jaw-type clutch so simple in operation that it requires only periodic lubrication; and a compensating holddown with an individual spring actuated plunger in each foot... FOOT-OPERATED SQUARING SHEARS, BENDING ROLLS either hand or motor operated, and ROTARY COMBINATION MACHINES are among other fine Wysong and Miles products.

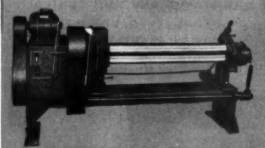
Write now for full information on the complete Wysong and Miles Sheet Metal Line. Remember . . . Wysong and Miles Sheet Metal Machines are economical in both initial investment and continued operation.

WYSONGand MILES CO

625 FULTON STREET, GREENSBORO, NORTH CAROLINA

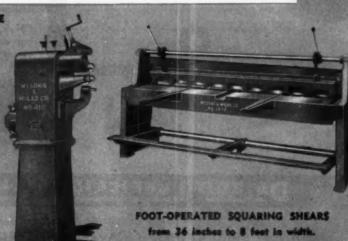
ROTARY COMBINATION MACHINE

with special ettachments for Retary Shearing, Boading, Crimping, Wiring, Elbow-edging, Sitting, Flancing, etc.



BENDING ROLLS,

meterized in 48, 60 and 72 inch widths; hand operated in 36, 42 and 48 inch widths.







"DETROIT" CRC-239-P AND CRC-239-PF ADD-ON CONTROLS

Easily installed on manual type CRC-239 Float Valves. With "Detroit" No. 411 Room Thermostat they make space heaters and floor furnaces automatic, save oil, increase comfort.



"DETROIT" NO. 411 ROOM THERMOSTAT

Eliminates overheating and consequent fuel waste. Accurately controls temperature for greater comfort.





"DETROIT" CRC-433

Automatically keeps heater supplied with fuel. Eliminates hand carrying, spilling and mess. No attention needed after installation.



"DETROIT" CRC-520 THREE-WAY VALVE

Used where a second tank is installed for reserve supply and more economical purchasing of oil. Cast brass body, 1/8" or 1/2" F.P.T. connections.



"DETROIT" Furnace Master A COMPLETE Furnace Control IN ONE UNIT



Easily applied, furnished with all internal wiring completed. Field installation requires only connection to 115 volt supply and low voltage cable to thermostat. All parts instantly accessible for cleaning and service. Compact, neat, efficient.

TYPES AVAILABLE

CRC-239-FFL provides two-speed control of draft motor.

CRC-239-FHL provides forced draft on high fire, natural draft on low fire.

CRC-239-FNL is designed either for natural draft burners or continuous forced draft.

CRC-239-FFL and CRC-239-FHL provide a predetermined post-draft period, after room thermostat is satisfied, to burn excess fuel.

REMOTE BULB BLOWER AND LIMIT CONTROL

With integral "summer" settings for controlling air conditioning fan. Blower range fully adjustable from 100° to 180° with 25° differential. Limit control reduces fuel delivery to pilot at desired temperature.

DETROIT LUBRICATOR COMPANY

DIVISION OF AMERICAN RADIATOR & Standard Sanitary CORPORATION

General Offices: 5900 TRUMBULL AVENUE, DETROIT 8, MICHIGAN

Canadian Representatives -- RAILWAY AND ENGINEERING SPECIALTIES LIMITED, MONTREAL, TORONTO, WINNIPEG

"DETROIT" HEATING AND REFRIGERATION CONTROLS • ENGINE SAFETY CONTROLS • FLOAT VALVES AND OIL BURNER ACCESSORIES "DETROIT" EXPANSION VALVES AND REFRIGERATION ACCESSORIES • STATIONARY AND LOCOMOTIVE LUBRICATORS



AN

GET A BIGGER SHARE OF THE SMALL HOMES MARKET WITH THE THATCHER C-174



Compare these Thatcher C-174 features with any other unit:

- COMPACT OCCUPIES MINIMUM FLOOR SPACE
- ATTRACTIVE ENAMEL CASING
- HEAVY CAST IRON GRATES ROCKING AND DUMPING LOCOMOTIVE TYPE
- DOUBLE INLET CENTRIFUGAL BLOWER
- HEAVY GAUGE STEEL CONSTRUCTION
- REFRACTORY BRICK LINED FIRE BOX
- CONVERTIBLE TO OIL

For further details on this outstanding unit write for a free folder today.

More and more of today's homes need small heaters. And that's why the Thatcher C-174 builds sales for you. Here's a forced air unit specifically designed for small homes. Coal fired, it converts quickly and easily to oil.

You'll sell loads of these units and sell them fast. For home builders go for the low initial cost . . . the low operating expense, averaging 4 tons of coal per season. And they go for the Thatcher quality construction that's backed by Thatcher's 98 years as heating specialists. That's why you recommend yourself when you recommend Thatcher . . . your warm friend since 1850.



GARWOOD, NEW JERSEY



Comfortmaster Oil-Fired



Comfortmaster Gas-Fired Air Conditioner



Triple-Fire All-Purpose Boiler



Oil Master Automatic Oil-Fired Boiler



Thermaster Gravity



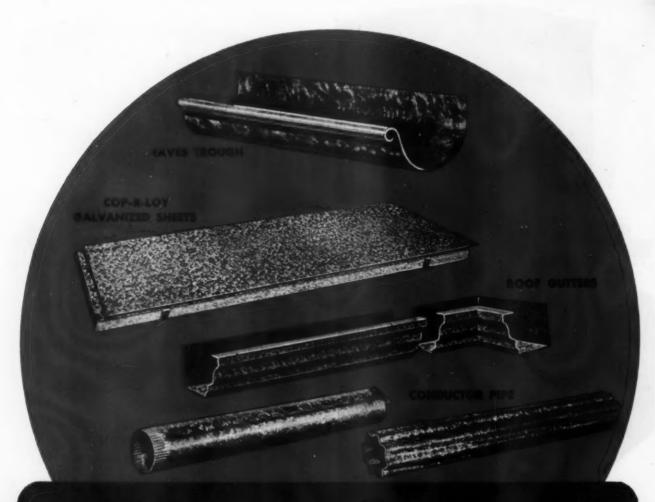
New 550

Oil-Fired

Air Conditioner



New A-204 Oil-Fired Air Conditioner



One job helps sell another when you sell WHEELING COP-R-LOY PRODUCTS



WHEELING CORRUGATING COMPANY . WHEELING, W. VA.

LOUISVILLE

BOSTON MINNEAPOLIS BUFFALO NEW ORLEANS CHICAGO

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You're IN on ANY JOB with

Luxaires 3 in/

AIR CONDITIONING UNIT

ENGINEERED FOR



COAL

Hand Fired · Stoker Fired



EASILY CONVERTED and well adapted for

OIL



and GAS

Luxaire's "3 in 1" coal unit has been designed and is constructed to provide all the necessary requirements and the versatility for converting to oil, gas or stoker firing at any time.

The compact, enameled steel cabinet houses both the heating and blower compartments . . . the rugged, steel heating element with long fire travel and large heating surface, most essential for conversion, is welded leak-proof and gas-tight.

The blower compartment can be assembled at either the right or left side of the heating compartment for flexible heating installations.

An automatic humidifier is standard equipment.





Series G Gas-Fired, Stee Gravity



Series H
Gas-Fired, Utility
Steel Air
Conditioning Unit



Series CA Gas-Fired, Cast Iron Air Conditioning Uni



Series O Oil-Fired, Stee Air Conditionin Unit



Series VH Oil-Fired, Ster Utility Air Con ditioning Uni



Series 700 Ceal-Fired, Stee Gravity Furnace



Series C Coal-Fired, Cast Gravity Furnace

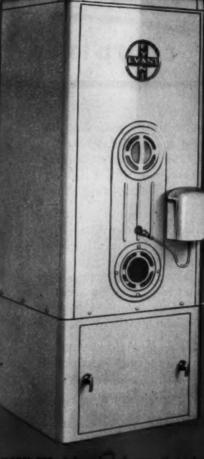
THE C.A.OLSEN MANURACTURING COMPANY

Luxaire Heating & Air conditioning units

ELYRIA 12, OHIO

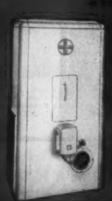
THESE EVANS UNITS COVER OF YOUR HOME HEATING







You can sell an EVANS oil-fired
WATER HEATER with every installation!
May be installed anywhere—no gas of electricity needed. Quality built Evans Water Heaters are entirely automatic—water Heaters are entirely automatic—provide more hot water at less cost than any other type of water heater. As an ideal 45 gal. 30 gal. 20 gal sizes—an ideal selection for the small home.



/10085 200-A ferred of former that takes the place

of 3 separate units

act, winter air conditioner that can be installed toment, closet or utility room. Produces 82,500 8.T.U. A powerful 10" Strocco blower circulates. Elsered worm air in winter cool air in summer "Magic Mind" control unit assured completely automatic operation. Blower may be installed at sides, back or underneath.

4 MODEL 378-A space savia forced air fornece

Compact, fully automatic, and only 30 wide to go through a standard door Factory wired and assembled ready for installation in closes, basement or utility room, Built-in blower, Power draft and "Magle Mind" control unit. \$2,500 B.T.U.

output.

ONLY EVANS BRINGS YOU'S LINE ENGINEERED

MORE THAN INSTALLATIONS!

From twenty-five years of experience as one of the world's largest manufacturers of heating and air moving devices EVANS brings you a line of heating equipment tailored to meet your sales requirements and the heating needs of your customers. Only EVANS gives you a line designed to keep inventory low, your profit margin high, and your installations simple. Here are the facts! See how they meet your needs . . . fill your customers' heating requirements . . . and you'll want the EVANS line.

EVANS

HEATING & APPLIANCE DIVISION PLYMOUTH, MICHIGAN



A revolutionary

MODEL 598—A new low cost automatic conversion burner for small homes

A revolutionary new burner that makes possible low cost completely automatic heat for small home owners at an operating cost they can afford. Exclusive Evans telescope air duct assures snug space saving fit on any type furnace. 100,000 B.T.U. output.

MODEL 458—A low cost automatic floor furnace that takes no room space at all

This compact oil-fired furnace fits flush in the floor—no basement needed. It provides all the heating comfort-you would expect from a full-sized basement installation and no duct work is necessary.

50,000 B.T.U. output.



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Don't let PRESSURE get you down!



CALL US FOR STEEL

In our eleven warehouses, conveniently located from coast to coast, we are gradually building our stocks of steel to permit us to do a better job of meeting your requirements for—Stainless, High Strength and Alloy Steels; Hot Rolled and Cold Finished Bars, Structural Shapes, Plates, Sheets, Metalworking Machinery, Industrial Supplies, etc.

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PITTSBURGH (12) 1281 Reedsdale St., N. S. Allegheny 4200
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SAN FRANCISCO (1) 1940 Herrison St., P. O. Box 368

MArket 1-4988
ENterprise 1-0017

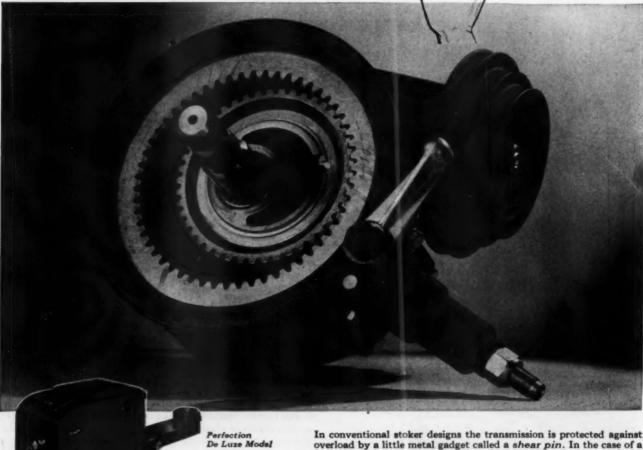
I CITY 2545 University Ave., 5t. Paul (4), Minn.

UNITED STATES STEEL

RECOGNIZED AS TOPS IN STOKER DRIVE DESIGN



No Shear Pin!



In conventional stoker designs the transmission is protected against overload by a little metal gadget called a *shear pin*. In the case of a blocked feed screw, the pin is sheared off, thereby disconnecting the motor from the driving mechanism. Until a service man can replace the pin, the stoker is inoperative.

The Winkler Stoker has no shear pin! Its transmission is fully protected against overload damage by the Winkler Safety Release. If an obstruction should block the feed screw, this device automatically and continuously disengages and reengages the motor and trans-mission until the obstruction is removed. The Winkler Stoker thereupon resumes operation without the need for service!

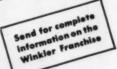
Note well the construction of the Winkler Stoker Transmission. The inherent mechanical advantages of internal planetary gearing are ingeniously employed to provide a driving unit of extraordinary power. At the same time, this design materially reduces the heavy

tooth load which causes rapid wear or breakage.

Combine the many Winkler design advantages, such as the extra power transmission—improved coal distribution to retort—improved air distribution to coal bed—compensation for variations in coal sizes... yes, combine all of these, and many more, with Winkler's Assured Sales Program that provides

Winkler merchants with the hardest-striking sales power ever assembled for use with this class of product and it is

this class of product, and it is easy to understand why Winkler Stokers continue to out-distance competition.



ous Winkler "Inter-Plan" Transmission, cover a complete range of or and Self-feed models for he

NKL fully automatic STOKERS

U. S. MACHINE CORPORATION, Dept. AT-6, Lebanon, Indiana

elf-feed Model

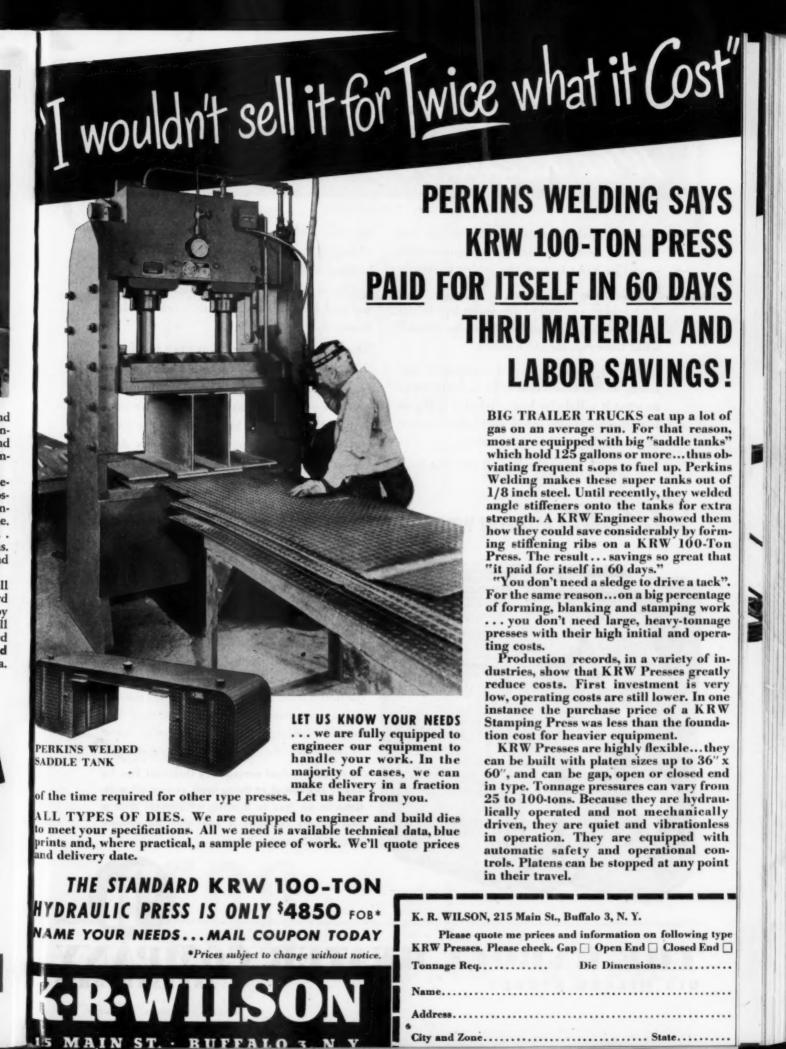
Industrial



PERI SADI

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It's the CONSUMER Who keeps you in BUSINESS

The furnace dealer must handle the line that will meet best the consumer's requirements—and he looks to you, the jobber to supply such a line.

As a jobber you sell to the dealer but in the final analysis it's the consumer who decides what lines you should handle.

In buying a heating unit the consumer considers not so much how it is manufactured as what it will do for him — what it will give him and his family in comfort, convenience, dependability and fuel economy.

For over 35 years the Rybolt line has been

the choice of the consumer who appreciates real value because it gives him most for his heating dollar. Its reputation for enduring quality is based on sound practical engineering and honest standards of workmanship material.

There are heating units that may sell for a little less—there are some that have a wider sale—but there are none that dollar for dollar, give the consumer more lasting service and satisfaction, than Rybolt. And in the long run this means more stable business and bigger profits for both you and your dealers.

Rybolt CAST-IRON WINTER AIR CONDITIONER - Series 152 - Coal Fired EASILY CONVERTED TO GAS OR OIL



This Rybolt Winter Air Conditioner is thoroughly modern, smartly styled and moderately priced. It embodies many important advanced features which assure the utmost in comfort, convenience and trouble-free heating service, which means clean, properly humidified, evenly controlled heat. For its heating element has the well known Series 15 cast-iron, coal-fired fur-

nace. The full height blower cabinet can be placed at either side for convenience in installation.

To meet any fuel emergency this unit can be easily converted to firing with gas or oil with little or no loss in heating efficiency. With a few simple changes it can also be readily adapted for stoker firing.



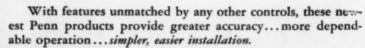
THE RYBOLT HEATER COMPANY

615 MILLER STREET

*

ASHLAND, OHIO

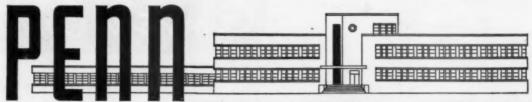




Uniform, positive expansion throughout the operating range of the liquid power element assures quick and accurate response to bonnet temperature changes. Ambient temperatures cannot affect the control because of Penn's exclusive patented self-compensating diaphragm.

Compact snap-acting "all-new" magneseal contact structure in bakelite case is dust-proof and tamper-proof. Large silver contacts under heavy pressure assure better electrical performance. Simple "sight-set" calibrated dial shows both cut-in and cut-out points. Summer "fan-on" position on dial with concealed adjustable stop to permit return to winter setting by user. Available in fan or limit control and in combination models.

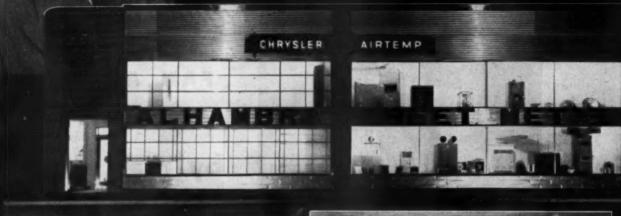
Get detailed information now. Ask your wholesaler or write for Bulletin 2716. Penn Electric Switch Co., Goshen, Indiana. Export Division: 13 E. 40th Street, New York 16, U. S. A. In Canada: Penn Controls Ltd., Toronto, Ontario.



AUTOMATIC CONTROLS

"The Airtemp 4-Season Line Produces Profits All Year!"

Says R. A. EVANS, Airtemp Dealer,
Alhambra, California



Alhambra Sheet Metal's modern new showroom in Alhambra, California.

"We have found Chrysler Airtemp a most profitable line," says Mr. Evans. "The 4-season line produces sales the year around and the respected Chrysler Airtemp name makes our selling job easier. With excellent national and local advertising backing us up and the fine cooperation your factory training program for Sales and Service has given us, our Airtemp dealership has proved a real money-maker for us."

Before you decide on a dealership—write for full details on Airtemp and the "Basic 6" factors essential to a profitable dealership. Learn how Chrysler Airtemp gives you *all* SIX. Mail the coupon today—we'll send complete information promptly.



Partial view of second floor of display room.

AIRTEMP DIVISION OF CHRYSLER CORPORATION
Dayton 1, Ohio
In Canada: Therm-O-Rite Products, Ltd., Toronto

AIRTEMP DIVISION OF CHRYSLER CORPORATION Deyton 1, Ohio Please send me information regarding Chrysler Airtemp dealership.	
Name	
Address	
Phone	(AA-I



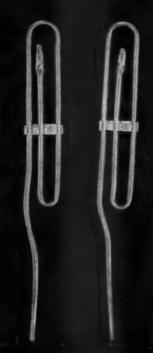
AIR CONDITIONING . HEATING COMMERCIAL REFRIGERATION

The ORIGINAL

Hydraulic - Action Fan and Limit Control



WHITE-RODGERS ELECTRIC CO., ST. LOUIS, MO.











RIVETING

Use smooth, centerless-ground or cold drawn rivet stock of fine-grained structure. Drive smaller rivets cold, finishing heads in two or three blows. Hotdrive larger sizes - over 3/8"-at about 2000°F. completing them as rapidly as possible.

STORY NAMED INVESTIGATION OF THE OWNER.



POLISHING

Wheel speeds for polishing ENDURO Stainless Steel run slower than for buffing: about 6000 sfpm, is average practice. When oiling-out is required between polishing and buffing, a fairly stiff sewed rag wheel, surfaced with turkish flour emery, is a good medium.

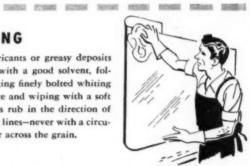
TAMPICO BRUSHING

A Tampico fibre brush, operating at relatively slow speeds of 1000-1500 sfpm. with a compound of fine aluminum oxide and oil mixed to a consistency of light paste will give ENDURO Stainless Steel a No. 6 commercial-dull velvet-finish.



CLEANING

Remove lubricants or greasy deposits by washing with a good solvent, followed by sifting finely bolted whiting on the surface and wiping with a soft cloth. Always rub in the direction of the polishing lines-never with a circular motion or across the grain.



There's no trick to cashing in on the tremendous profit potential waiting for stainless steel fabricators. More how-to-do-it information is ready for you in Republic's two books written especially for sheet metal contractors—"THE FABRICATION OF REPUBLIC ENDURO STAINLESS STEEL" and "THE WELDING OF REPUBLIC ENDURO STAINLESS STEEL." Easy-to-follow text and photographs show you stepby-step procedures. Write for your free copies today.

REPUBLIC STEEL CORPORATION

Alloy Steel Division . Massillon, Ohio GENERAL OFFICES . Export Department: Chrysler Building, New York 17, New York

...AND THE BEST TIP



ALWAYS

Republic ENDURO STAINLESS STEEL

Other Republic Products include Black, Galvanized, Galvannealed and Electro Paintlok Sheets — Toncan Iron Sheets



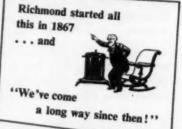
Now! A Unit Designed with the TRADE in Mind!

Another Richmond "Plus". In the new Richmond Oil-Fired Winter Air Conditioner you get a real installation time-saver. First locate your furnace. Then you simply hook up the burner to the panel and all elements are right where you want them. No time and trouble on unnecessary adjustments—that means \$25 to \$35 saved.

Final Assembly is quick, too. This Richmond unit comes in

three packages—the heaviest weighs only 395 lbs. (appr.). All you do is place combustion and burner assembly in the furnace unit, spin four wing nuts and make electrical connections at junction box. That's all! Now you're

ready for supply lines and flue connections. Unit Installed!



(RR)	OND COMPAN
Was and the second	

0	a long way since then!"
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	CLIP AND MAIL COUPON TODAY
	Richmond Radiator Company
	19 East 47th Street, New York 17, N. Y. AA-9
	Gentlemen:
	I am interested in the New Richmond Gun-Type Oil-Fired Winter Air Conditioner. Please send me full details. No obligation, of course.
	Name
	Company
	Address

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1948

When you install a **PETRO** it soon starts <u>selling</u> the neighbors!



GOOD NEWS, Petro news, travels fast. Give your customer a Petro installation—and the fine heating performance that goes with it—and he'll tell his friends. Everyone he meets will hear of Petro year-round reliability and economy—to your benefit and profit!

The established plumbing and heating jobber in your wholesale trading area will gladly give you details on the complete Petro line—including oil burners, boiler-burner units, furnace-burner units and water heaters.

PETROLEUM HEAT AND POWER COMPANY Stamford, Connecticut

Makers of Good Oil Burning Equipment Since 1903
REFINERIES...FUEL OIL STORAGE AND DISTRIBUTION TERMINALS
NATIONWIDE OIL BURNER SALES AND SERVICE FACILITIES

WHAT ELSE DO YOU GAIN WITH PETRO?

OUTSTANDING SELLING FEATURES, such as patented "Tubular Atomization" assuring your customer more heat from less fuel.

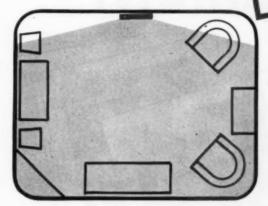
VIGOROUS PROMOTION THROUGH NATIONAL ADVERTISING, reaching every oil burner prospect in your territory . . . building up a preference for Petro and helping pre-sell you as a leading heating contractor in your community.

PRODUCT DEPENDABILITY, reflecting over 45 years' oil heat "know-how" of the world's oldest, largest exclusive oil-heat equipment maker.



The IEG NO. 75 NONPAREIL*

NON-PREMIUM-PRICED A.C. REGISTER



NONPAREIL is defined by Webster as, "Without an equal" — and that exactly describes the position of the H & C No. 75 in the field of popularly priced air-conditioning registers. Furthermore, in the opinion of many, better results are obtainable with the No. 75 than with registers costing considerably more.

IDEAL AIR DISTRIBUTION

The TURNING BLADE VALVE of the No. 75 extends to the back of the Stackhead

(when open) and smoothly divides the airflow with uniform distribution to all parts of the face. This results in greatly lowered resistance, far less turbulence and, consequently, thorough distribution to the farthest parts of the



THE
INCOMPARABLE
TURNING BLADE
VALVE

INCONSPICUOUS — AS REGISTERS SHOULD BE

The 75 does not project into the room, and when decorated in the color scheme of the room (for which its prime coat finish affords an ideal base) it's as inconspicuous as a register can be.

room. No other register can employ this incomparable valve.

SEALED TO STREAKING

PREVENT STREAKING

The sponge rubber gasket attached to rubber register face prescribe register face prescribe register face prescribe register register



Upward, downward, or straight delflections are instantly obtained by adjusting the valve regulator; sideway deflections by bending the fins.

PRACTICAL AND EFFICIENT IN ANY LOCATION

Installations may even be made in the corner of a room, without decreasing the full volume of the airflow or danger of streaking the adjacent wall.



See this outstanding Air-Conditioning register at your Johbers' or consult our catalog No. 48 for full details. HEC

Airflow of a corner installa-

tion.

HART & COOLEY MANUFACTURING CO., Holland, Mich.

In Canada: Hart & Cooley Mfg. Co., Fort Erie, N. Ontario

48

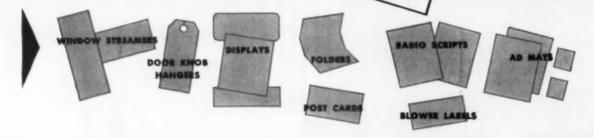


TO BOOST YOUR PROFITS WITH DUST-STOPS

Now is the time to promote 'em—to sell 'em—when the more than 2½ million owners of forced-warm-air heating systems require air filter replacements. Now, in the next several months, a big advertising campaign in BETTER HOMES & GARDENS, AMERICAN HOME, HOUSE & GARDEN and HOUSE BEAUTIFUL will remind those owners to have their filters changed. So, now is the time for you to tie in with this campaign and get yourself more business with extra profits . . . from additional service jobs as well as filter sales.

Your DUST-STOP distributor or jobber is ready now to supply you with free tie-in advertising materials... and give you prompt delivery on DUST-STOP Air Filters. Contact him today. Owens-Corning Fiberglas Corporation, Dept. 930, Toledo 1, Ohio. In Canada, Fiberglas Canada Ltd., Toronto, Ontario.







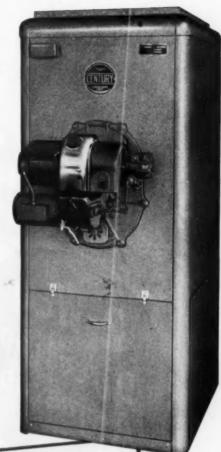
AIR FILTERS

– a Fiberglas* product

Here's How!

TO GET THE HEATING BUSINESS IN YOUR COMMUNITY...
FEATURE CENTURY FOR LOW-COST AUTOMATIC OIL HEAT!

CENTURY AUTOMATIC OIL FURNACES



THE NEW "CUSHION-CRADLED" CENTURY BURNER is now included in all Century heating units!

LO-HIBOY 85,000 BTU

Yes—you enjoy a definite sales advantage when you offer your customers the original and proven features of Century Automatic Oil Heat. All Century units include the "Cushion-Cradled" Burner which absorbs vibration from all moving parts... the famous Crescent Super Heaters... plus new Century firing head that delivers high CO² and eliminates pulsation. These features add up to minimum fuel consumption! Mail the coupon below for full information about the new Century Lo-Hiboy, the new Century Winter Air Conditioners... and a Century franchise for your community.

WINTER AIR CONDITIONERS 105,000 TO 380,000 BTU

Century

CENTURY ENGINEERING CORPORATION Cedar Rapids, lowa

Please rush me full information about the new Century Lo-Hiboy, Winter Air Conditioners and details about a Century dealer franchise.

Firm Name

Address_

Send to Attention of Mr ._

City___

__State_

OIL BURNERS . BOILER BURNER UNITS . WARM AIR FURNACES . HUMIDIFIERS . WATER HEATERS . AIR CONDITIONING

948

ALRO-FLEX Registers "1000" SERIES "1000" LESS ALRO-FLEX

2-Wa4
Direction
Direction
Adjustable

Airo-Flex is also made in the

"4000" Series with vertical bar grille and multiple louvre. Method of adjustment of grille bars shown below. This gives

4-way control.

Here is an adjustable register that helps you hold down costs, and yet does credit to any job. Smoothly formed and finished, it is not easily pulled out of shape, makes a good close-fitting installation, and has all the appearance of a more expensive register. Use this ideal economy model — the Airo-Flex "7000" line — on your forced air jobs for which 2-way deflection is sufficient. The single louvre is operated by a unique and patented spring tension device, permanently positive. Fins are adjustable for up-ordown flow. Beautifully designed, neat and substantial in construction, the Airo-Flex is an Auer quality product throughout. Supplied for wall or baseboard, also intakes.

Auer offers a complete line of modern and attractive floor, base, and wall registers and return faces, for gravity or air conditioning systems — including all air directional types. We also make flat metal grilles for ventilation, concealment, or other purposes.

Ask for Auer Register Book
—or Special Grille Catalog.

THE AUER REGISTER CO., 3608 PAYNE AVENUE, CLEVELAND 14, OHIO



Innulair **√** Design Bu **√**Construction **√**Performance

A new blue flame pilot . . . Annulair closely approaches a 100% aerated gas flame in its characteristics.

ONLY ANNULAIR HAS ALL THESE ADVANTAGES

- Stable pilot flame with: High ambient temperatures. Varying gas pressures. Varying specific gravities.
- Dirt and lint clogging minimized.
- Annular primary air opening.
- Low primary air velocities.
- · Larger gas ways.
- · No ignition at primary air opening.
- Stainless steel pilot tip.
- · Steel bracket.
- · Replaceable orifice.
- Lower cost.

MADE IN THREE TYPES-Type B - Horizontal and Type C - Vertical are low consumption types for use with water heaters, space heaters and similar smaller appliances; Type D is designed for large appliances. Annulair is manufactured for use with manufactured, natural and LP gas.

TYPE D Send for for larger appliances Bulletin SR473 Automatic SAFETY PILOT

TYPE B HORIZONTAL

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TYPE C VERTICAL G. A. M. A.

MILWAUKEE GAS SPECIALTY CO.

MILWAUKEE 1, WISCONSIN

SPACE 521

LISTED-APPROVED



NOW—two famous laboratories have tested the Dravo Counterflo Heater and found it to be constructed in accordance with their standards. Effective immediately all standard gasfired Dravo Counterflo Heaters will bear the American Gas Association and Underwriters' Laboratories, Inc., marker indicating approval and listing, respectively. In addition all standard oil fired Dravo Counterflo Heaters are listed by Underwriters' Laboratories, Inc.

For additional information regarding sizes, efficiencies, specifications, etc., write Dravo Corporation, Heating Section, Dravo Building, Pittsburgh 22, Pa. Ask for bulletin GK-516.

DRAVO CORPORATION

PITTSBURGH - PHILADELPHIA - CLEVELAND - NEW YORK - CHICAGO - DETROIT - ATLANTA

Sales Representatives in Principal Cities





THE NEW 500 M. V. B-60 COMPLETELY SELF-CONTAINED AND SELF-OPERATING CONTROL SYSTEM ORIGINATED BY GENERAL CONTROLS

For natural, manufactured or L.P. gases. For all kinds of domestic, commercial and industrial applications. System consists of the B-60 pilot operated diaphragm type gas valve, the T-70 Series Snap-action Thermostat, which is scientifically correct in design, and the new improved ingenious PG-9 Pilot Generator which produces 450 to 500 millivolts of operating current, safety control, and main burner ignition. The B-60 Series of controls have set new standards throughout the gas industry. For complete specifications on the GENERAL CONTROLS broad line of Automatic Pressure, Temperature and Flow Controls, request new Catalog and Service and Instruction Manuals.



Automatic, Safe, Silent and Self-Operated

GENERAL CONTROLS

Manufacturers of Automatic Pressure, Temperature & Glow Controls

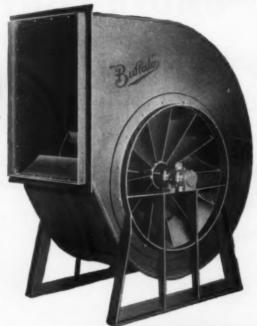
FACTORY BRANCHES: Birmingham (3), Boston (16), Chicago (5), Cleveland (15), Dallas (2), Denver (10), Detroit (8), Glendale (1), Houston (2), Kansas City (2), New York (17), Philadelphia (40), Pittsburgh (22), San Francisco (7), Seattle (1) - DISTRIBUTORS IN PRINCIPAL CITIES

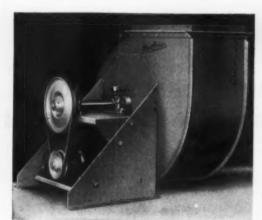
FANS THAT "FIT"

The Job - The Installations



These are the fans so widely used for centralized ventilation and operation of large air conditioning units—designed primarily to move large volumes of air at very low noise levels. In sizes up to half-a-million cfm at up to 5" pressures, this design provides flexibility in arrangement and discharge position. The most efficient type for curved inlet or outlet ducts, it is THE fan for large-scale air moving. Write for BULLETIN 3339.







One-piece, light-weight design and readily accessible pulleys for quick capacity changes make this one of the easiest to install—to move to different locations—and to adapt to the particular job. It's a sturdy, quiet, efficient fan, too—lower in all-over cost than many other types. Often this is just the fan to solve your problem and your customers'. 600 to 12,000 cfm sizes. Indoor or outdoor installation. Write for BULLETIN 3499.

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504 BROADWAY

BUFFALO, N. Y.

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

Branch Offices in all Principal Cities



EQUIPMENT FOR

- * VENTILATING
- * HEATING
- * COMFORT
- ★ PROCESS
- * AIR TEMPERING
- * AIR WASHING
- * EXHAUSTING
- * BLOWING
- * FORCED
- * INDUCED DRAFT
- * PRESSURE BLOWING
- * CLEANING
- * DRYING

CUTTING AIR COSTS IN EVERY BRANCH OF INDUSTRY

Climb On!

Another DOLE Sure Profit Proposition

- A remarkable new product that helps to make people comfortable!
- Nationally advertised this heating season to millions of consumers in Better Homes & Gardens and other household magazines.
- All the "bugs" removed by years of field tests, which gave positive proof of performance.
- \$ Backed up by "Dole Valve" a name that has meant profit to more people in the heating industry every year since 1906.
- Not just a warm air register but a temperature control system. Sells as a multiple installation, several at a time. A good sized order!
- Installation is simple but for best results it takes a little of the "know-how" any warm-air man has. Dole tells you how.
- A direct immediate sale. Can be installed while the heating plant is in operation—all through the season you'll be offering prompt relief to people with a heating problem.
- An easy sale! It not only gives the luxury of indoor temperature control, room by room at low cost but it actually saves money by saving fuel.

What more could you ask! Let's go!
Ask your warm air wholesaler for
prices and installation data. Write
us your questions.

DOLE



hermostatic AIR CONTROL FOR ORGED WARM AIR

CONTROL WITH DOLE

1933 STATE OF THE PANY

1933A Carrell Avenue, Chicago Lit, Illinois

brilliant performance

Sampsel automatic controls assure best performance from the heating equipment you build or sell, for any fuel. Samps consistently leade basic improvement to a powerful to the powerful to the control of the control of



Saves 10% to 30% on fuel oil consumption

Here's the greatest fuel-saving and sales-building idea in years! Makes important fuel savings by prevention natural draft from cooling thing plant while burner is not open the trasity installed; quickly pay



SEQUENCE DRAFT CONTROL

Increases Stoker Efficiency; Reduces Servicing

Performs normal Fire Pilot functions — and more! Scheduled interruption in firing cycle gives superior combustion, permits burning greater variety of coals, and eliminates "coke tree" nuisance. Extreme simplicity makes servicing easy — and infrequent.



Write today for full details on the amazing Sampsel Sequence Draft Control and Thermo-Interruption Fire Pilot. Also for catalog describing the complete line of Sampsel precision-built automation controls for gas, oil, and coa



SEL TIME CONTROL, INC., Spring Valley, III.





TWO MODELS -The Series "80" LO-BOY delivers 85,400 Btu.; is 26"

wide, 53" long, 47" high. The HI-BOY, as illustrated, delivers 82,300 Btu.; is 25" wide, 34" long, 67" high.

Advertised nationally in BETTER HOMES & GARDENS, AMERICAN HOME and SMALL HOMES GUIDE.



MAIL THIS COUPON NOW!

Jones & Brown, Inc. 439 Sixth Avenue Pittsburgh 19, Pa.

Yes, by all means send me all the facts on your KO-Z-AIRE "80" IMMEDIATELY!

Address

tyled to THE TIMES

Smart modern homes...cleverly modernized interiors for old homes...the more of these jobs you're called on to heat the more it becomes evident how far U. S. engineers were ahead when they styled today's lines of registers. You can't beat them for harmonious beauty plus highest air-delivering efficiency with today's heating systems.

U. S. NO. 256 SERIES

4-WAY FLOW A-C REGISTERS

As neat and trim as any modern home interior. Use it for sidewall or ceiling. It works perfectly no matter haw your stack-head comes in, and the combination of multiple valves and adjustable grille bars. gives you any direction of air flow needed for best heating results.

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U. S. NO. 40 SERIES

GRAVITY BASEBOARD REGISTERS

For either gravity or converted-gravity systems there's no equal to the No. 40 Series in appearance, efficiency, and ease of installation. Removable grille masks register interior. Patented engaging buttons speed installation. No loose screws to be lost.

REGISTERS

UNITED STATES REGISTER CO. MANTILE CREEK, MICHIGAN

Amazing New Fire Prevention Safety Control by

20th CENTURY'S GREATEST SAFETY INVENTION

Thousands of fires annually are caused by runaway furnaces and overheating. Forgetting to close the draft is the most common form. Many are caused by electrical failure of electrical controls. Field now introduces a safety control which "remembers when you forget"...a control that overcomes the hazards of mechanical or electrical failure. While the largest market for it exists in the handfired field, there is a demand for it as an auxiliary safety control where automatic equipment is installed. The nightmare of "going away and forgetting to close the furnace damper" is so vivid to so many thousands of homeowners, that the new Field Safety Control will sell almost upon suggestion. It comes completely packaged and is easy to install.



for Operation

There is a vast market for the Field Safety Control on heating plants even where electrical control thermostat and limit controls are installed. Current stoppages, even though infrequent, can be the cause of overheating. The Field Safety Control, installed at low cost, can be a safeguard of real assurance to owners of automatic heating;

PERFORMS WHEN ALL OTHER CONTROLS FAIL The new Field Safety Control does

not depend on a mechanical contrivance or electrical current for operation. It is operated entirely by a heat coil. When the bonnet temperature reaches the danger point, the control closes the draft automatically and thus prevents fire danger and damage to heating plant by runaway fires. It is an emergency control, absolutely dependable.



Completely Packaged!

FOR EASY INSTALLATION

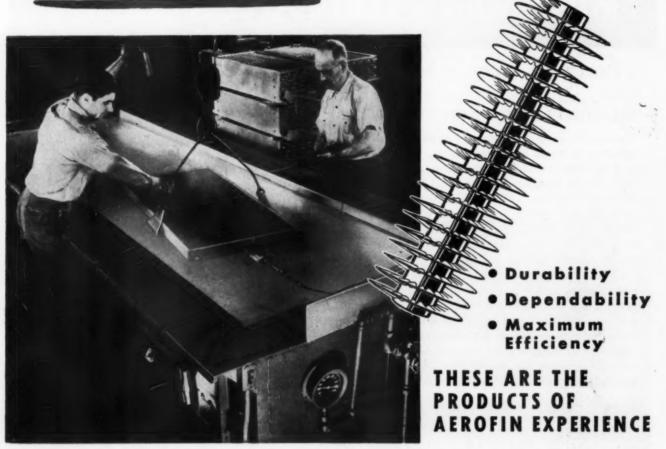
WRITE FOR LITERATURE, PRICES AND DEALER INFORMATION

H. D. CONKEY & COMPANY . MENDOTA, ILLINOIS

AFFILIATES: CONCO MATERIALS HANDLING DIVISION

CONCO BUILDING PRODUCTS, INC

WHY YOU CAN DEPEND ON AEROFIN...



These men are looking for air bubbles . . . they are testing Aerofin heat transfer coils with air pressure for structural defects.

If there are no bubbles, it means the immersed Aerofin unit has withstood the terrific strains of steam and hydrostatic pressure tests and is ready to give you long, efficient service.

Your assurance of dependability is Aerofin's rigid testing . . . backed up by selected materials and advance design. Every unit is completely tested.

Another part of the same story of leadership is the accuracy of the famous Aerofin ratings . . . good for the life of the unit.

All this effort is to maintain and improve Aerofin's leadership in the manufacture of high efficiency heat transfer coils for all heating and cooling applications.

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EVICTOR

Quality Furnaces Since 1890

BUILTORS

WITH HEAT FINS

Over half the furnaces you install are round furnaces . . . and the complete VICTOR line of round, galvanized furnaces is accepted as the "standard of quality" the nation over. There are no finer furnaces built. The line includes the Deluxe Series "F" (shown here), the Series "C", and the Series "M". All of rugged, boiler-plate steel construction with one piece heavy steel base ring, similar to model illustrated.

You can handle no finer, more complete, more adaptable, money making line than the VICTOR... Furnaces for COAL, GAS and OIL.

The Victor DeLuxe Series "F" Round Furnace has all the Patented Exclusive Mechanical Features as the Square Enameled Model.



COAL . GAS . OIL FURNACES . OIL BURNERS . STOKERS . BLOWERS . ACCESSORIES

HALL-NEAL FURNACE CO.

VICTOR Quality Furnaces Since 1890

1322 N. CAPITOL AVENUE - INDIANAPOLIS 7, INDIANA

HEAT REGULATED THERMO-DRIP HUMIDIFIERS



Adjusts Automatically to every Humidifying Need the extra efficiency—extra economy—extra ease of installation of Thermo-Drip Humidifiers. Especially since they come to you at no extra cost.

Thermo-Drip Humidifiers achieve perfect balance of humidity and temperature at all times. Faster evaporation is caused by thin layer of water on stainless steel pan.

Once installed, Thermo-Drip Humidifiers require little or no attention. The bi-metal thermostat does all the work—supplying the correct amount of moisture.

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Automatic

HUMIDIFIER CO.

CEDAR FALLS, IOWA



GETS THERE FAST... ANYPLACE...ANYTIME

A SMALLER, LIGHTER
ENGINE DRIVEN WELDER
PORTABLE OR SKID-MOUNTED

YOU CAN BE SURE

IF IT'S

Westinghouse

You'll find the answer for tough field construction and maintenance jobs in this new Flexarc Ranger. The Ranger goes to work anywhere, anytime . . . travels faster, farther, over rougher terrain . . . works in places inaccessible to larger, heavier equipment. It trails along at highway speeds . . . produces "shop" welds where electric power is not easily available. Yet, the Ranger equals big-welder efficiency at lower operating costs.

Powered by a 4-cylinder Hercules industrial engine, the Ranger has a rating of 200 amps, 30 volts, 50% duty cycle, with a welding current range of 30 to 250 amperes. 2-wheel, spring-mounted, pneumatic-tired, standard road gauge running gear permits towing at high speed. Welder comes complete, with all essential accessories.

For full details on the Ranger and other Flexarc A-C Welders, call your nearby Westinghouse office, or write Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Penna.

Westinghouse Heavy-duty Engine-driven Welders

This husky welder is built for hard, continuous service wherever electric power is not available. Single, preset current adjustment gives the exact welding current desired without drop-off. Gasoline or diesel engine operated . . . available in 200, 300 and 400-ampere ratings . . . supplied with either bedplate or wheels.





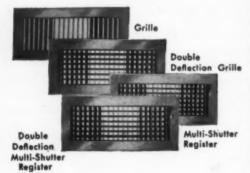
Westinghouse FLEXARC WELDERS AND ELECTRODES



Check the size of grilles and registers you normally install for air conditioning jobs . . . then check the standard Tri-Flex and Aerovane sizes.

You'll readily see why T&B STANDARDS meet practically all requirements ... how they eliminate haphazard selection that can be exceedingly troublesome. And there are other important advantages of standardization ... efficient production methods mean cost savings ... on-the-shelf stock assures quick delivery.

Tri-Flex
26 STANDARD SIZES



8	x	4
10	x	4
10	×	6
12		
12	x	5
12		
14	x	4
14	x	5
14	x	6
16	I	5
16	x	6
20	x	5
20	×	6
20	x	8
24	x	5
24	x	6
24	x	8
24	x	10
24	x	12
30	x	6
30	X	8
		10
		12
36	x	8
36	×	10
36	x	12



10 x	6
10 x	8
12 x	6
12 x	8
12 x	12
18 x	6
18 x	12
18 x	18
24 3	12
24 ×	18
24 x	24
30 x	12
30 x	18
30 x	24
36 x	18
36 x	24
36 x	30
48 x	24
48 x	30
48 ×	36





Grille



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RFE

Multi-Shutter Register

FOR DETAILED DESCRIPTION, ENGINEERING DATA AND COM-PLETE SELECTION INFORMATION . . . WRITE TODAY FOR A COPY-OF BULLETIN 47TF.



NEW BRITAIN, CONNECTICUT

56



stantly reminds your customers of the comfort coming
from your automatic heat. Perfex helps get you the
business you deserve—Perfex puts your name in the

MANUFACTURERS OF AUTOMATIC CONTROLS BEARING THE TRADE MARK HAMES
OF LEADING PRODUCERS OF AUTOMATIC HEATING SYSTEMS AND APPLIANCES

living room.

RFEX CORPORATION, MILWAUKEE 7, WISCONSIN, Perfex Controls Ltd., Toronto 1, Ontario

You can take <u>pride</u> along with profit in a job like this



LET'S SAY you've just been asked to estimate a roof drainage job on a better home. The owner wants something that's both attractive and durable.

That's your opportunity to recommend an all-stainless installation. You'll want to point out that stainless is one of the strongest of all metals . . . strong enough to stand up under heavy loads of ice and snow without sagging . . . to prevent cracking under extreme temperature changes.

You can assure your prospect that ARMCO Stainless Steel, being a solid rustless metal, will last the life of the house . . . that, properly installed, it won't discolor in service or stain adjoining surfaces.

Then you can tell him that the soft, silvery finish of ARMCO Stainless blends well with any color scheme.

To clinch the job, just tell him that this modern metal, with all its advantages, actually costs less than any other top-quality material commonly used for roof drainage.

Your men can work ARMCO Stainless Steel on standard shop equipment. Workability of 28-gage Type 301 ARMCO Stainless is about the same as 26-gage galvanized and both you and the owner will take pride in the finished job.

You sell satisfaction—at a good profit—when you install gutters, downspouts, canopies and other equipment made of Armco Stainless Steel. Armco Steel Corporation, 330 Curtis St., Middletown, Ohio. Export: The Armco International Corporation.

ARMCO STAINLESS STEELS



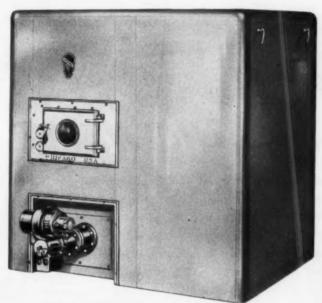


THE HESS CLIMATE MASTER



leasily converted to coal or gasl

represents the greatest advance in Automatic Radiant Heating



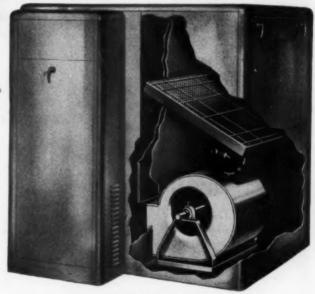
Standard Model—without vestibule (Flange or base-mounted burner optional, depending upon availability)

The cut-away view at the right shows the arrangement of the forced air unit, air filters and heat transmitter. The silent but powerful blower draws the cool air from the rooms thru the filters to remove germ-laden dust and dirt. The cleansed air then passes uniformly and under pressure over the heated surfaces of the heat transmitter and the humidifying element. The filters, motor and blower are in the cool air circuit and therefore are not subject to overheating damage and fire hazard as with other units that draw heated air thru the blower compartment.

The Hess Climate Master has an outstanding advantage over conventional oil-fired furnaces because it is designed for conversion to other fuels, should fuel conditions make this necessary, without sacrificing heating efficiency.

The Hess Climate Master represents the greatest advance in the design and engineering of automatic comfort-making equipment. The powerful, efficient, radiant heat transmitter, oil burner, forced air unit, filters and self-flow humidifier are all combined within one compact, attractive baked enamel cabinet. Best of all, luxurious comfort, health benefits, cleanliness and maximum fuel economy are the outstanding features of this fine equipment.

Models illustrated are equipped with pressure oil burner, completely automatic in operation, designed as an integral part of the Climate Master to assure correct performance, maximum operating efficiency and greatest fuel economy. The de luxe models are furnished with a vestibule enclosure (shown in the cut below) which conceals the oil burner assembly.



DeLuxe Model—with vestibule
(Blower unit interchangeable for either side of unit)

A PRODUCT OF THE HESS CONSEQUENCY

GENERAL OFFICES: 1211 S. Wester & Avenue, Chicago & Illinois

PACTORIES: Chicago et il Cicère, Illinois



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, 1948



MORRISON STEEL PRODUCTS, INC., BUFFALO 7, N. Y.



There is more than one answer to the problem of corrosion in ductwork. But considering cost of materials and their workability, there is a practical solution in the use of a rust-defying, copper-bearing galvanized sheet steel like Beth-Cu-Loy.

Beth-Cu-Loy Sheets offer a double defense against rust. Beth-Cu-Loy is protected on the surface by Prime Western zinc applied in a tight, bright coating. Under the coating is the Beth-Cu-Loy base containing 0.20 to 0.30 percent copper, with 2 to $2\frac{1}{2}$ times the rust-resistance of ordinary steel. Result: if rust eventually penetrates the zinc coating, it comes up

against a barrier of copper-bearing steel.

Beth-Cu-Loy sheets have the easy-forming qualities that sheet-metal men like, yet they have adequate stiffness to permit the use of long sections in ductwork. They are simple to cut, to seam and to solder. With all of these advantages, Beth-Cu-Loy Galvanized Sheets cost very little more than ordinary zinc-coated steel sheets.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem Products are sold by Bethlehem Pacific Coast Steel Corporation

Beth-Cu-Loy Galvanized Sheets



CHECK THE FACTS and you'll find

PERFORMANCE is what the PUBLIC PUBLIC WANTS



WILLIE &

NEW MODELS

Complete units for homes of all sizes. Beautiful compact units for steam or hot water.





Complete Winter Air Conditioners for



Sales and economy champion! Oil-O-Matic with the Low Pressure Principle.

That's why Oil-O-Matic Owners Always recommend Oil-O-Matic

Based on the Low Pressure Principle

While the average home owner may not immediately understand the engineer's enthusiasm for the Low Pressure Principle, he is interested, always, in the results it assures. Oil-O-Matic delivers the utmost in automatic oil heat comfort, convenience, and fuelsaving economy. That's why, with hundreds of makes to choose from, one out of every eight burners is an Oil-O-Matic.

Oil-O-Matic dealers have the best franchise in their field, founded on an outstanding product, factory-dealer teamwork, aggressive merchandising, and dynamic selling. The best burner means the best business . . . for the Oil-O-Matic dealer.

> Oil-O-Matic Dealers are Automatic Heat Merchants

Headquarters for FUEL CONSERVATION ENGINEERING



WILLIAMS OIL-O-MATIC DIVISION, Eureka Williams Corporation, BLOOMINGTON, ILL.



♦ Whether it's simple...

or complicated)



You can make it BETTER with U·S·S Stainless!

You're working with galvanized steel every day. U·S·S Stainless Steel can be handled on the same equipment by varying procedure slightly.

That's a fact. Alert metal working shops all over the country are proving it. And they're busy and making more money by taking on more of these extraprofitable Stainless Steel jobs that people are willing to pay more for because they know they're getting more for their dollars—in greater endurance, permanent good looks and freedom from rust and corrosion.

What is more, you can get U·S·S Stainless Steel-the finest Stainless produced—and all you need, right away. We can supply your requirements completely in No. 2B and No. 4 Finish Sheets. Ready, too, for immediate delivery and in adequate supply are Bars that meet high standards of machinability; Plates in sizes up to 120 inches wide and 360 inches long; Seamless and Welded Tubing; Pipes, Angles, Channels and Welding Electrodes — in all standard grades and specifications.

All you have to do is contact your regular supplier, or phone, wire or write one of the warehouses of United States Steel Supply Company. You'll find one in your city or not far away.

AMERICAN STEEL & WIRE COMPANY, GENERAL OFFICES: CLEVELAND, OHIO
CARNEGIE-ILLINOIS STEEL CORPORATION, PITTSBURGH & CHICAGO
COLUMBIA STEEL COMPANY, SAN FRANCISCO · NATIONAL TUBE COMPANY, PITTSBURGH
TENNESSEE COAL, IRON & RAILROAD COMPANY, BIRMINGHAM
UNITED STATES STEEL SUPPLY COMPANY, WAREHOUSE DISTRIBUTORS, COAST-TO-COAST
UNITED STATES STEEL EXPORT COMPANY, NEW YORK



U·S·S STAINLESS STEEL

SHEETS . STRIP . PLATES . BARS . BILLETS . PIPE . TUBES . WIRE . SPECIAL SECTIONS

UNITED STATES STEEL

WIN \$100.00 NAME THIS VIKING BLOWER-PACKAGE



Isn't it a breath-taking beauty? Here is the most sensational, eye-compelling design in the heating field. Look it over closely and you'll agree it packs more sales power, bigger dollar value, greater customer acclaim than any blower package you've ever seen. It's as quiet as a soft whisper, and it's built to an operating standard of performance never known before in the forced warm air circulating field. Alert, sales-minded dealers will be the first in their territories to get a bigger profit by installing this new "Viking." Order from your jobber today. If he doesn't have any in stock yet, wire us collect and we'll tell you where to get them. Do it now.

CONTEST RULES

Viking offers \$100.00 for a name packed with sales punch for this new blower package. Competition will be limited to bonafide dealers and jobbers in the heating field, together with their employees. In case of similar names, duplicate prizes will be awarded. Contest closes midnight, September 30, 1948. Submit as many names as you wish. It costs you nothing, not even a box top.



AIR CONDITIONING CORPORATION 5600 WALWORTH AVE. . CLEVELAND 2, OHIO This is the name I would suggest for the new Viking Blower-Package.

Suggested Name____

Submitted by_____

Address____

State



Delco has always meant the best in motors—and this new Compressor Duty Motor line by Delco represents another outstanding advance in "designed for the job" power units.

Engineered specifically for compressor use, these new Delco Motors are quiet, efficient and free from vibration. New construction techniques insure long, trouble-free operation under the most adverse conditions.

These really new Delco Compressor Duty Motors are available for application to your air conditioning and refrigeration line. For complete data on Delco Motors write to Delco Products, Dayton, Ohio, or call our nearest Sales Office.



CHECK THESE FEATURES OF THE NEW DELCO MOTOR

- The inner and outer races of the ball bearing on the end opposite the drive end are locked to give maximum thrust capacity.
- Polyphase motors have double squirrel cage rotors; die cast aluminum conductor bars and end rings.
- Close tolerance air gap between rotor and stator.
- Main frames and end frames are of rigid cast iron construction.
- Extended accessible mounting feet cast as unit with main frame.
- Single phase available from 1 h.p. through 5 h.p. and polyphase available from 1 h.p. through 7½ h.p. 1800 R.P.M.

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DELCO MOTORS

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Sheet Metal Protects the Workers of Science

To an ever-increasing extent, the sheet metal industry is responsible for the health and safety of those who work in scientific research, the chemical industry and related fields. In the nation's industries, as well as in its homes and offices, proper ventilating and heating are basic necessities.

For more than a century, we have served sheet metal shops to the best of our ability. Thirteen Ryerson plants now work with sheet metal contractors from coast to coast.

We deeply regret that current demand makes it impossible to supply all the steel that is needed. But we're making every effort to improve our service... and we hope that the time will soon come when we can provide all the steel you need, when you need it.

Joseph T. Ryerson & Son, Inc. Plants: New York, Boston, Philadelphia, Detroit, Cincinnati, Cleveland, Pittsburgh, Buffalo, Chicago, Milwaukee, St. Louis, Los Angeles, San Francisco.

RYERSON STEEL

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ARTISAN,

OUR INDUSTRY MUST HAVE SHEETS

The supply of metal sheets available to heating and sheet metal contractors is shrinking. Slowly and surely, free unallocated steel sheets are shrinking under the voluntary allocations program. On the other hand, housing, termed "essential" under this program and for which contractors will need sheets in the immediate future, is continuing its thundering pace. With 94,000 housing starts estimated for July, the total for the first seven months of 1948 indicates 550,000 starts, a gain of 120,000 over the same period in 1947. It has become obvious this increased demand will soon be felt by our industry and at a time when allocated steel sheets will have made serious inroads into the present inadequate supply.

Housing, industrial expansion and improvement programs, public buildings, and applications of sheet metal to industrial processes have now accumulated tremendous backlogs for sheets that would appear insurmountable under normal conditions. In the immediate future there will be few occasions that will justify the use of precious sheets for non-essentials and all signs point to the situation getting worse before it gets better. Except for a period early this year when it looked as though the need for merchandising would soon be here again, there has been developing a doubt whether this market could be supplied in the face of a continuing and more critical shortage as the military and European aid programs get into full swing.

All industry cannot apply to the Office of Industry Cooperation for relief under its Voluntary Agreements Programs. This has been reserved for industries essential to the civilian economy and requiring materials in critically scarce supply. The amount of steel available to OIC represents only a small percentage of steel's annual production. But allocations made so far are drawing heavily on sheets. Also, industries now knocking on OIC's door are asking for allocations of sheets.

Our Industry Essential

Our industry is faced with the necessity of establishing its essential character in order to obtain a reasonable supply for essential and sustaining operations. Sheet metal for housing, for industry's expansion and

processes, and for replacement of heating and sheet metal equipment to insure conservation, public safety and health, is under these circumstances a reasonable expectation. Upon this premise we expect relief from the impending sheet shortage by obtaining an equitable share of the nation's sheet production.

The recent price hike has not priced steel out of any market and there is little hope of any slackening in demand in the immediate future. Invalidation of the base pricing system has had no influence on its competitive situation, at least not in today's seller's market. On the contrary, abolishment of base pricing has played into the hands of the gray market because under that system the producer had some control over shipment until delivery at its destination. Under the present freight on board system, a purchaser may ask for delivery at the mill after which the producer has no knowledge of its destination.

The simple clerical procedure of obtaining a license as a means of export control of our critical supply of galvanized sheets in our do-good-all-over-the-world program has not worked. Gray marketeers care little about validation responsibilities when preparing governmental forms and so, critical sheets find their way into the gray market. Export wrapped, marked, and realistically damaged sheets have been purchased by our industry—at a price. Reports of these shipments indicate that after taking a breath of sea air and returning at another port, their value increases to approximately \$300 per ton. There is plenty of such evidence to show that the steel industry could hike steel prices many times current levels if its prime objective were profit.

High priority demands for aluminum by the aircraft industry on the West Coast will greatly affect the supply of aluminum from that area. Both the European aid and the military programs are getting started and as their demands are felt the supply of aluminum sheets will get tighter and tighter.

The allocation by OIC of 9,500 tons monthly of sheet steel for steel houses represents a new drain on the sheet supply. When steel is so scarce it seems incredible that this tonnage, amounting to about onethird of the warm air heating equipment allotment, should be set aside for a type of construction that places an excessive demand on a basic material. Especially when the basic material is so short in supply that an allocation plan has been instituted in an effort to channel it into essential industries.

Under these circumstances, it is time for heating and sheet metal contractors to make known their needs for basic materials in order that they may continue their essential services to housing and industry.

Voluntary Industry Agreements

The need for steel in industries whose products are essential to housing was recognized last year under Public Law 395 which authorized voluntary industry agreements and provides for voluntary allocations of critical, basic materials. Under this law OIC was authorized to negotiate agreements with basic industries producing materials essential to the production of end products which are in critically short supply and industries producing these end products. For example, under this program 450 manufacturers of warm air heating equipment received an allocation of 233,000 tons of steel for the eight month period starting July 1.

Current agreements provide for allocations of 444,000 tons of steel monthly for atomic energy, freight cars, warm air heating, military, petroleum, sheet steel houses, and anthracite coal.

As these agreements were approved it became evident that many would hold priority over the sheet steel supply. This was brought to the attention of Mathias Niewenhous, who at the time was chief of the Building Materials Negotiating Divisoin of OIC, during a meeting last June, with the National Heating Wholesalers Association. His attention was directed to the omission of a proportionate amount of sheets required for installation of the warm air heating equipment provided for under the allocation. Mr. Niewenhous expressed amazement when the wholesalers told him the steel allocated for this equipment would be ineffective unless sheet metal for plenums, ductwork and fittings was also included. At that time he suggested that the association gather and present data on the sheet metal required to the Steel Products Advisory Committee.

Three Associations Acting

Three associations in the industry, the National Heating Wholesalers Association, the National Association of Sheet Metal Distributors, and the Sheet Metal Contractors' National Association are joining forces and meeting with Lindsay Howell, newly appointed acting chief of building materials, to present evidence of the metal sheets required by this industry and which must be considered if the present rate of housing continues.

Surveys by these associations confirm the impending critical sheet supply facing the industry. While there has been much doubt about the effectiveness of a voluntary allocation program, R. M. Colegrove, executive secretary of the wholesalers, states that aluminum and steel executives advise and urge this program as the only means to alleviate the situation and the only way for our industry to gain recognition of its needs in the coming months.

All evidence indicates the lapse of many years before

steel will be in good supply. Aluminum, says Mr. Colegrove, which has filled many gaps in the past, will become even scarcer than steel.

Last July, the wholesalers started a survey among its members to determine their sheet requirements, reflecting of course the needs of contractors. At the same time, all were urged to contact members of Congress, government officials, and prime suppliers of sheets, impressing upon them the utter folly of a program that allots critical material for equipment without provision for the ductwork that transmits the heat to the living rooms. He reports that the membership has responded to this appeal with the result that government officials and producers understand the situation and are anxious to do something about it. But, warns Mr. Colegrove, the battle is not won and cannot be won until all interested persons in the industry act in unity to secure an allocation.

SMCNA Sheet Survey

Investigating the contractors' position in the looming shortage, SMCNA several months ago embarked on ϵ comprehensive survey of the needs of its membership. This survey, capable of gauging accurately the industry's requirements is published on the next page.

Over the signature of E. B. Brown, Jr., chairman of the Trade Relations Committee, the survey and supporting commentary has already been forwarded to committees of OIC. Mr. Brown's comments, in part, are as follows:

this industry's needs. There is geographical distribution. There are large, medium sized, and small shops included. All the varied activities of this industry are covered. We believe this 237 shop report can be projected for the 1,000 members of association, for the 10,000 sheet metal contractors commonly termed "the industry," or for the 20,000 sheet metal contractors there probably are when all shops are counted.

We consider an adequate supply of galvanized and black sheets to be essential if one million new homes are to be heated with warm air furnaces in 1948. We must have sheets to connect a furnace to its registers and grilles.

We believe that America needs new and enlarged hospitals, schools, public buildings, apartment buildings, and commercial and industrial structures.

. . . Historically, contractors bought most of their sheets from jobbers. Today, those jobbers are not receiving enough sheets to satisfy our requirements for essential construction, despite the fact that production of sheets is increasing.

As the survey discloses, our contractors are being deluged with offers of sheets by the gray market. We cannot help wondering where these large tonnages are coming from. Some we know are rerouted export; some we know are sold into the gray market by (mill) customers who are getting more sheets than they can use; some we believe are entering the gray market through channels which are not recognizably legitimate channels of sale.

Sheet metal contractors have no wish for mandatory controls of inventory or distribution; nor for priorities, etc., of the war era, but if sheet production is all going to be ear marked for this and that essential need, we believe we are essential and want to be so considered.

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In a letter addressed to Senator Kenneth S. Wherry (Nebraska), member of the Committee to Study the Problems of American Small Business, Joseph D. Wilder, executive secretary of SMCNA brought the critical situation to the attention of that committee. Mr. Wilder's letter reads, in part, as follows:

Our situation is deteriorating. Unless there is improvement in our supply of metal sheets, work said to be essential to our economy cannot be completed.

. . . We are advised by OIC that our request (for allocation of sheet metal) is being studied.

We do not wish to be thought of as a pressure group. We ask no special consideration . . . We do feel that too much steel is going into export, because out of export is coming a considerable tonnage of the sheets now being offered our contractors by the gray market.

The Chicago Tribune, in its issue of August 24, reported a statement by Chairman Ploeser (Missouri) of the house small business committee in which he charged that the administration is increasing steel exports to the detriment of domestic industry, instead of cutting exports as promised.

He said small business organizations throughout the country had indorsed his demands that steel exports be reduced until the current domestic shortage has been alleviated.

Actual exports are greatly in excess of authorized tonnage quotas, he asserted, with monthly exports exceeding the monthly quotas required in the eight industry voluntary programs, including steel supplies for

the important atomic energy commission.

He charged that notwithstanding a promise of Commerce Secretary Sawyer that steel exports would be reduced, they are continuing to increase. Export quotas for the third quarter have been increased to 1,140,260 tons from 1,023,776 tons in the second quarter, said Mr. Ploeser. In the first quarter the quota was 735,085 tons, but actual shipments were 1,495,000 tons, he said.

Ploeser said his committee has received hundreds of complaints from business, even those with defense contracts, that they cannot obtain steel through regular channels and must resort to gray and black markets, paying premium prices.

"Almost every basic industry in the United States needs steel," said Representative Ploeser, "yet in the face of this domestic demand, we are continuing to export steel to various European countries to the great disadvantage of our own economy and national security, and particularly to the disadvantage of small business.

Contractors Help Needed

All readers of American Artisan are urged to participate in this effort by the three associations.

Letters offering active participation or supplying useful data about sheet metal supply may be addressed to either association or American Artisan. Letters addressed to this office will be forwarded to the applicable association.

SMCNA Sheet Metal Survey*

The Sheet Metal Contractors National Association has released the following report of a survey made by its Trade Relations Committee. E. B. Brown, Jr., defines the term sheet metal contractor and describes the following functions of the contractor:

- Installs warm air heating systems (furnaces) and the duct or pipe work thereto;
- (2) Fabricates and installs the metal work on houses and buildings, such as gutters, downspouts, metal roofs, cornices, flashings, spandrels, etc.
- (3) Installs ventilating systems in schools, public buildings, factories, office buildings in conformance with health laws, using metal sheets to make the ducts.
- (4) Fabricates and installs air handling systems for the removal of noxious fumes; for the removal of waste products in manufacturing processes; for the conveying of gases and materials in manufacturing processes in conformance with industrial health laws and standards.
- (5) Installs air conditioning systems (heating, cooling and combinations) in commercial spaces, schools, public buildings, recreational structures, homes, offices, etc.

(6) Manufactures numerous metal products such as metal windows, metal doors, lockers, shelving, metal ceilings, building products, all manner of items used in industry such as pans, tanks, machine guards, marquis, canopies, hoods, smoke stacks and breechings, skylights, kitchen and dairy equipment, etc.

Our Importance in Construction

Unless our industry can obtain metal sheets for the types of work listed above—homes cannot be heated with warm air furnaces; houses and buildings cannot be protected against destruction by rain and snow; schools and public buildings and commercial or factory buildings cannot be ventilated in accordance with our state laws of sanitation and health; manufacturing plants cannot be protected against the hazards of fumes and dust; no structure or space can be cooled or air conditioned; commercial and industrial buildings cannot be occupied until the safeguards to health and against accidents are made by the installations of this industry.

Our Current Situation

In a few words, the continuance of this industry rests primarily on the industry's ability to get the metal sheets to do the work listed above. Like many other

^{*} Copyright, 1948, by Sheet Metal Contractors National Association

industries, this industry, today, finds itself unable to complete work under contract or to meet the demands placed upon us by home builders, commercial and industrial establishments unless and until this industry obtains metal sheets through established and recognized channels of distribution and at prices which do not increase the final cost of the work beyond the owners ability or willingness to buy our services.

Month by month during 1947 and in 1948 this industry has been finding its customary sources of supply for metal sheets drying up. Men are being laid off, work is being stopped—because we cannot obtain metal sheets. The tremendous extent of the gray market in metal sheets has become a source of wonderment to our industry and a cause for concern to the buyers of our service who—to get work completed—must authorize our contractors to purchase metal sheets in the gray market at double or triple warehouse prices. Much work is being postponed because of our industry's inability to get metal sheets at legitimate prices.

In an effort to establish the true state of our problem, the Sheet Metal Contractors National Association (the national association for this industry) prepared and mailed to its 1,000 members a "Questionnaire." The facts and individual reports were compiled and tabulated from such members' reports.

The National Association believes that these 237 reports represent a true cross-section of the industry and of our situation. There are large and small contractors included. Geographical distribution is fairly complete. All the various activities followed by the industry are included.

Briefly, here are the important facts established by the survey:

Size and Dollar Volume of Contractors

In 1940 the 237 employers reporting, employed a total of 2,334 workmen and did a total dollar volume of work of \$12,544,000. This is an *average* of \$53,000 gross volume for each shop. The average number of workmen employed was ten.

In 1946 the 237 employers reporting, employed a total of 2,978 workmen and did a total dollar volume of work of \$20,306,000. This is an *average* of \$86,000 gross volume for each shop. The average of workmen employed in each shop was twelve.

In 1947 the 237 employers reporting, employed a total of 3,697 workmen and did a total dollar volume of work of \$26,690,000. This is an *average* of \$112,600 gross volume for each shop. The average number of workmen employed was sixteen.

The projection of this 1947 report to 1,000 members of the National Association gives: (1) a total of 16,000 workmen employed; (2) a total gross volume in sheet metal work of \$112,600,000.

If we accept a commonly used figure of 10,000 recognized sheet metal shops in the country, this gives a total gross volume of more than one billion dollars.

The Metal Sheet Situation

In the replies these facts on our supply and need for metal sheets are disclosed:

GALVANIZED SHEETS-

In 1939, 237 contractors used 8,440 tons.

In 1940, 237 contractors used 10,410 tons.

In 1947, 237 contractors used 11,365 tons.

In 1948, (first quarter) 237 contractors got—2,797 tons.

In 1948, for a full year on this basis—11,164 tons. If 2,797 tons of galvanized sheets were used by 237 contractors in the first quarter of 1948 and if an equal quantity is obtained in the 2nd, 3rd, and 4th quarters, the total tonnage received for the 2nd, 3rd, 4th quarters would be 8,391 tons.

But, as shown in the survey, these 237 contractors estimated their needs for the 2nd, 3rd, 4th quarters (based upon contracts in hand or expected) to be 13,812 tons. This indicates a shortage of 5,421 tons in the 2nd, 3rd, 4th quarters.

This appears to forecast an average shortage of 23 tons in each shop for the 2nd, 3rd, 4th quarters of 1948.

For 1,000 contractors this 23-ton shortage projected equals a 23,000-ton deficit. For 10,000 contractors (the industry figure used previously) the *shortage* will be 230,000 tons in the remainder of 1948.

BLACK SHEETS-

In 1939, 237 contractors received or used 3,771 tons. In 1940, 237 contractors received or used 4,734 tons. In 1947, 237 contractors received or used 7,428 tons. In 1948, (first quarter) 237 contractors used 1,474

For the full year of 1948, current receipts would project to 7,896 tons which is slightly above 1947 usage.

The figures on black sheet needs are somewhat misleading. A study of the individual firm tabulations will show that a great many of the smaller general shops use almost no black sheets, whereas the shops specializing in industrial work use large quantities. A separate tabulation of industrial shops using black sheets shows that such firms are encountering increasing difficulty in obtaining black sheets.

The Gray Market

Forty-four contractors out of the 237 reporting state they have bought sheets in the gray market. Some bought only small quantities, some bought large quantities

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This means 18 per cent of the firms reporting are buying sheets in the gray market.

Of the 237 reporting, 79 per cent have been approached by mail, in person, by phone with gray market offerings.

The prices paid by the 44 reporting were

The prices paid by	the 44 repor	ung were.	
		Representative	
		Warehouse Prices	_
		Quantity 450 lbs.	to
Gray Market l	Prices for	1500 lbs., Delivere	d,
Galvanized 8	Sheets	Chicago, 7-1-48.	
30-gauge—13c per	pound	.0835	
28-gauge—10c to 1'	7c—av. 13½c	.077	
26-gauge-10c to 1'	7c—av. 13½c	.0725	
24-gauge- 81/2c to 1'	7c—av. 13½c	.090	
22-gauge—12c to 1	5c-av. 13½c	.066	
20-gauge—12c to 18	5c—av. 13½c	.065	
18-gauge—13c to 15	5c—av. 14c	.0635	

The quality of sheets received from the gray market and the uncertainties of dealing with these unknown operators is completely summarized in the "Interim Report, Steel Supply and Distribution Problems," issued by the Senate Committee to Study the Problems of American Small Business.

The Materials We Need

This industry, for the uses described above, ordinarily, in a free market uses galvanized sheets of these gauges, in order, 26 ga., 24 ga., 28 ga., 22 ga., 20 ga., 18 ga.

Black sheets, in order, 16 ga., 14 ga., 12 ga., 10 ga. Aluminum sheets, in order, .025; .032; .020; .040.

Aluminum Sheets

As shown by the reports, this industry used practically no aluminum sheets in 1939 and 1940. But in 1947 and 1948 more and more contractors turned to aluminum sheets to carry out their commitments.

Contractors Are Now Using Aluminum Sheets

Up to a few months ago, aluminum sheets and coil were fairly plentiful. Today, this industry is told aluminum production will be allocated to aircraft and other uses and deliveries are now as slow as six months. Many contractors, who can and will use aluminum sheets as galvanized sheets become scarcer, now find no aluminum sheets available.

Where We Get Our Sheets

From the 237 firms reporting, the picture of sheet distribution to our industry is as follows:

36 firms bought sheets in part from mills and in part from jobbers.

1 firm, only, bought all its sheets from mills.

200 firms bought sheets *largely*, or entirely, from jobbers.

The average firm, in 1940, bought sheets from more than three different jobbers.

The Situation-July 1, 1948

As stated, required housing and public and industrial work cannot be completed unless the contractors of this industry get sheets.

For the suggested one million new housing units to be built in 1948, the Office of Industry Cooperation, Department of Commerce, has established a voluntary "allocation" program under Public Law 395, and, as of July 1, had allocated 125,000 tons of steel to manufacturers of warm air furnaces, 17,000 tons of steel to manufacturers of registers used in house heating, 9,000 tons of steel to manufacturers of furnace blowers, 61,000 tons of steel to manufacturers of prefabricated ducts and pipe.

These products, used in residential heating, are useless until the sheet metal contractors get metal sheets to connect the furnace with the registers. The rule of thumb is three pounds of sheets for each pound of furnace. The survey and member work sheets show that for the average member reporting, 40 per cent of his work is warm air heating. Therefore, 40 per cent of the 13,805 tons of sheets required by 237 contractors in the 2nd, 3rd, 4th quarters would be used for heating systems—5,522 tons.

For 10,000 contractors, believed to be in the industry, that totals 230,000 tons of sheets.

The other 60 per cent of the requirements shown by

the survey will go into the ventilation, air conditioning, fume removal, waste material collection in schools, hospitals, commercial and industrial establishments to make these structures conform with the sanitation, health and safety laws of our states and nation.

The contractors in this industry are small business men, but very essential to the operation of our comfort, health and sanitation laws.

The commonest report on why the contractor does not get sheets is this:

"Our jobbers have our order for as long as six months and say they are not getting sheets from the mills."

Quotes

Here are some remarks from the questionnaires:

(1) "We conduct a small sheet metal shop in the ——
Valley. If sheets were available, we could handle six times the business we do now. Without the so-called gray market we would have had to close our doors months ago. Since the first of the year we have received from our regular sources of supply (jobbers) just six bundles of sheets. Sixty per cent of our sheets are now bought in the gray market. If sheets are available in the gray market, why can't our jobbers get any sheets? We feel there is crooked work going on and something should be done about it."

(2) "Since July, 1947, our regular jobber has given us just 1400 pounds of sheets. No prime sheets from another jobber since June, 1947. Our jobbers now ship us 'wasters' and 'seconds' with the statement that these are all they have. These are so poor they should be remelted. Within a short time we will lay off men because of the sheet shortage."

(3) "This I can say—if we do not begin to get sheets in something like an orderly supply—and within the next sixty days—we will close our shop. We have owned and operated this shop for thirty years. This is the picture we face after thirty-seven years in the trade."

(4) "We are buying in the gray market, at double normal prices, because we cannot get sheets otherwise. We could put at least twenty additional men to work if we could get sheets."

(5) "The only reason we have not been forced into the gray market was because we could get aluminum sheets. Now aluminum is getting scarce."

(6) "We are having to buy more than 50 per cent of our sheet needs in the gray market."

(7) "Unless legitimate sheet jobbers receive a much increased supply of sheets, we have the choice of closing our doors or buying in the gray market. We desperately need sheets for house construction in this area."

(8) "We will close our business before we go into the gray market—and this is exactly what seems to be happening."

(93 "Right now I need at least forty tons of galvanized sheets to complete local work under way. I am constantly turning down work because I cannot get sheets although I have a fine shop and trained men. I can double my present volume and complete some badly needed work if I had sheets."

(10) "We've been offered sheets on 'tie-in' sales making us buy materials we can't use. And one of the largest rolling mills in the world is right here in our town. They cannot give us any sheets—they say."

(Please turn to page 160)



Arnold Kruckman's

T WILL interest you to learn that the voluntary allocation control program is now in operation. Mr. Virden's Office of Industry Cooperation has been successful in implementing the earlier conversational projects. There are over a dozen industries which have signed up. Thus far the action has been limited to those which use metals. Steel and iron have been the principal interest. The program, as it now is in operation, provides an allocation of 107,000 tons of pig iron per month to manufacturers of pressure pipes, soil pipe, warm air furnaces, and similar products identified with the heating equipment industries. This allocation has been fixed as a monthly quota for the period between July 1, 1948 and March 1, 1949. It is reported that over 200 manufacturers are participating in this allocation program.

The warm air heating group, to the number of 450, collectively are now receiving 29,500 tons of steel every month during the indicated period of 8 months. The smaller manufacturer who depends upon iron, steel or aluminum is feeling the pinch more and more desperately. They are daily arriving in Washington in greater numbers to see what George Meredith and his Senate Committee for Small Business can do about it.

Special Session

The not so very lamented Special Session, in the opinion of most of us, here, in Washington, was chiefly a shadow-boxing match between the stately Congress and the statelier White House. It was infinitely more sound and fury than actual accomplishment. The main purpose was to make the other fellow look less stately so that the people out in the wide open spaces will vote for the group that appears most stately. The aggregate results might be best stated as thirteen days of stalling, and eleven days of slow and very reluctant work during which the Congress and the White House jointly spent two more billions of the taxpayers' money. This includes the \$65,000,000, which was slipped through the Session, for the United Nations Center in New York. Actually very few members of Congress were enthusiastic about this transaction, but they voted for it because they were mortally afraid, before election, to be placed in the position where some one might call them isolationists.

The Housing Law

The new housing law, which was enacted, is, as you know, simply something to take the pressure off the members of Congress who are running for reelection, which includes virtually every member of the House,

and one-third of the membership of the Senate. The slum clearance projects, and the other public housing suggestions, were dropped for the time being. But do not for a moment think that you have heard the last of the TEW bill. Senators Taft and Flanders, and others, are utterly convinced there must be slum clearance in the big cities, and in the South, and that the minimum housing needs, which stem from slum clearance, must be supplied by the Federal Government because the local governments would not be able to undertake such projects on the proper scale, and private enterprise would not be justified in undertaking the job because it would not pay.

Puerto Rican Project

They are quite convinced that the people in Puerto Rico have set a pace which should be followed. You may be familiar with what is going on down there. They are running up an enormous housing project for the very low-income group, consisting of units of 4 rooms: living room, bedroom, kitchen and bath. They build them of concrete board, the unit costing well under \$4,000, completed. It is reported they can construct fifty units a day. The program for minimum housing naturally is ardently supported by the people who are fighting for race equality, because they hold that one of the major blights upon the progress of the Negro in the South is the lack of decent housing. It is wise to keep an alert eye upon this situation. It will be brought up in Congress as soon as the next session assembles in January.

The new housing law, fostered chiefly by Congressman Wolcott, enables the Federal Housing Administration to insure loans up to 95 per cent, on homes costing \$6,000 or less. This is five per cent more than hitherto legal. FHA received an added fund of \$35 million to make loans for homes costing \$4,500, which is \$1,500 more than the former limit. Congress also supplied \$800 million to make loans on rental housing under Title VI. These loans may now be made under a limit of \$8,100 per apartment. The former limit was \$1,500 per room. The operator who gets the benefit of these loans must bind himself under oath that he will not discriminate against renting to families with children. Loans for construction are now legal up to 90 per cent on homes costing \$7,500 or less in projects of 25-family units and more. Veterans are eligible to obtain secondary loans of 50 per cent through FHA insured loans by means of the financing of the Federal National Mortgage Association. This doubles the former limit. Liberal loans are provided for manufacturers of prefabricated houses.

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Washington Letter





The new law gives the Housing and Home Finance Agency \$300,000 to conduct technical research, and to make studies, in order to develop and promote improved standardized building codes and regulations, as well as standardized dimensions and methods for the assembly of homebuilding materials and equipment. The law provides that a Director of Research should be appointed, and that the new Division may use the facilities of other Government agencies to carry out its program. There is no doubt that there is a legitimate need for this work; at the same time there is an uncomfortable feeling among certain trade groups represented in the Capital that this authority may release a great deal of idyllic striving among the do-gooders in the various agencies which have anything to do with housing. The fear seems to be that the release of this idealistic effervescence may upset some applecarts of existing down-to-earth ways of doing business and building and equipping housing and other structures, which may swiftly lead to more nationalization of the construction industry.

The law as now written guarantees a rate of 2.75 per cent on equity investments in rental property. There was adequate provision of funds by the Congress to defray the cost of all these changes.

Credit Controls

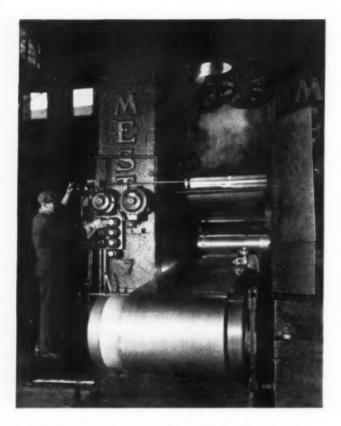
Another law enacted by Congress, which undoubtedly is if interest to your industry, is the Act which imposes some new credit controls. The old Regulation W has been re-imposed to control instalment buying. As a brake on the sale of consumer goods the controls are not popular with retailers and with sales managers. As of Sept. 20 higher down payments will be required on those things which cost \$50 or more. Everything will be included, but the controls are expected to hit chiefly new and used cars, washing machines, radios, television, phonographs, refrigerators, furniture, and similar articles. The down payment specified for automobiles is one-third, for other consumer goods, 20 per cent. Maximum maturity is 15 months for a credit up to \$1,000 and 18 months for credits from \$1,000 to \$5,000. Under the new credit control law the Federal Reserve Banks must continue to maintain 25 per cent gold reserves. Congress refused to up this level to 40 per cent. It is understood the rate of interest on demand deposits in central Reserve banks will be increased from 20 per cent to 30 per cent. In city Reserve banks the increase will be from 20 per cent to 24 per cent. The country banks are expected to increase the rates from 14 per cent to 18 per cent. Treasury has announced it will raise 1-year certificates from 11/8 per

cent to 1¼ per cent. Bank loan rates will rise in the same ratio. The Federal Reserve discount rate also will go up from 1¼ per cent to 1½ per cent. All this is not expected to give business trouble, although it is expected loans will be slightly more difficult to obtain. It is particularly stressed here that there will be no calling of loans. The object of the new controls naturally is to check further inflation, but not to hamper business. In other words, it is a gentle hint that the wild joyride is nearing the end, and that it behooves the business man really to get down to business. They tell us here that the effects of all these new brakes will not be perceptible until well into next year, when also the effects of the slide in farm prices are expected to be felt.

The Wallace Convention

The Wallace-Taylor Progressive Party Convention at Philadelphia is now a memory, but it is a rather bewildering memory to those professional observers who were present. Most of us went there expecting it would he sort of a freak performance slightly kindred to those conventions of hoboes that used to be held in the years gone by. There was so little confidence in the significance or the heft of the Progressive Party Convention that the majority of the correspondents in the Capital felt it was useless to risk the heat of the City of Brotherly Love for another gargantuan Turkish bath. Those who went, however, came away with the feeling that we are up against a far more serious thing in this movement than the business people of the country realize. There is no remote doubt that there is a restlessly driving movement of liberals, many of whom lap over into the fringe of Communism, and many more of whom are not utterly radical but are discontented with existing conditions, and who have no confidence in existing political labels or parties.

Your correspondent was a member of that press conference in the Bellevue-Stratford Hotel with Henry Wallace when he had his memorable collision with Westbrook Pegler, Dorothy Thompson, H. L. Mencken, and the rest. Perhaps when you heard about it over the radio, or read about it in your daily paper, it sounded very crashing. Actually Pegler was very polite, and the whole incident did not reach high voices or an actual state of tension. But it was clearly the opportunity when Wallace could have shown the stuff of which he is made—and he did. The professional reporters came out of that conference with an absolute disgust for the inadequacy of Wallace, and for his utter lack of courage in meeting a situation head-on and



FIRST, I want to tell you that this talk was not sent to me by the steel industry. Information contained in this talk is based on material gathered from books, newspapers, magazines, and Bureau of Labor, Bureau of Mines, and Department of Commerce statistics, all of which I put together to present as the viewpoints of a small manufacturer about the steel industry.

Let me spend a moment to tell you of industry's failure to tell its problems to the public. Executives in the steel industry are no exceptions. They will readily discuss their problems with other executives at their office, club, and in their home, but they decline to enter public discussions. They are usually too busy, are going out of town, or have other reasons. When only one side of the problem is presented without defense or opposition, it is often accepted as true. Children, for example, follow their parent's politics because they hear more of their parent's viewpoint.

Regardless of facts, the steel industry is in an awkward position as far as the public is concerned. Steel is one of the basic items necessary to industrial pro-

Nationalization of the Steel Industry

Fig. 1. This is one of Inland Steel's cold reduction mills. After the strip passes through the rolls its thickness is checked by a "flying micrometer."

duction that is mentioned as being ripe for controls. Its shortage is offered as the reason for controls by almost everyone wherever scarcity exists. Being a basic industry upon which most others depend, it should be controlled, is the way the thinking goes.

Last year, for instance, I was invited to participate in Albuquerque on the "Town Meeting of the Air." The subject of the broadcast, with a listening audience of more than seven million people over some 250 stations of the American Broadcasting system, was "How to Stop Rising Prices." I mention this because of the far-reaching effect of this coverage. My chief opponent was Clinton Anderson, then Secretary of Agriculture. Congressman Howard Buffet of Nebraska supported me and the Mayor of Minneapolis, Hubert Humphries, a former political science teacher of the University of Minnesota, supported Secretary Anderson. I want you to remember the Mayor as a former political science teacher.

Industry to Blame?

My opponents blamed industry—especially the steel industry—for high prices from lack of production, big profits, and large dividends. The Mayor insisted on another Office of Price Administration with its black markets as they prevail in Europe, but what shocked me most was his suggestion to have the government guarantee demand for steel, so the steel companies could embark on an extensive expansion program, or government construction of steel plants and thus put the Government in the steel business. This seemed to go well with the studio audience. I thoroughly agreed



The author of this speech, Oscar C. Palmer, is president of the Palmer Mfg. Co. of Phoenix, Arizona and a director of the National Association of Manufacturers for Arizona and New Mexico. As might be expected, he is an ardent advocate of free enterprise and his talk reflects his beliefs. He has delivered this speech before a number of civic groups in the southwestern part of the country.

OSCAR C. PALMER Palmer Mfg. Co. Phoenix, Arizona

Fig. 2. As you look at the smooth surface of a concrete structure you may fail to realize that there is a lot of steel reinforcing that concrete.

that production and more production both on the farm and in the factory would lower prices.

Everyone wonders why we do not have more steel production. Walter Reuther of the CIO and Senator O'Mahoney of Wyoming have openly declared that the steel companies are withholding steel and curtailing production in order to maintain prices. You never hear Philip Murray of the CIO mention the long coal and steel strikes, or the Allis Chalmers strike that delayed for eight months the motors for a new Bethlehem steel mill. He disregards the lost steel production for 8,000 automobiles and the 1,000 box cars per day in a small wildcat strike last October.

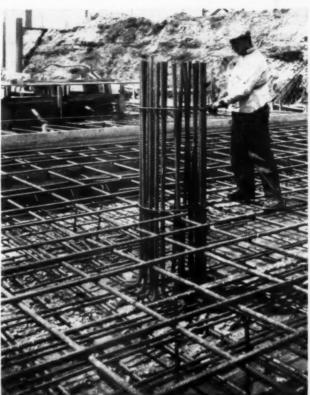
We all know that steel means a lot to every man, woman, and child in this country. It means a lot to business and professional men. It means railroad equipment, trucks, automobiles, buildings, and the commodities you sell and the industries you serve. It means reirigerators for your homes and toys for your children.

Many of us have improved and increased our manufacturing facilities during and since the war to where our break-even point, that is, our necessary volume of operation to offset the additional overhead and investment in facilities, is much higher. We should produce more goods in order to break even.

Steel Expansion

Let us analyze the steel industry's predicament—the mills that operated at only 65 per cent capacity during the last 20 years. It has increased the capacities of its mills. In 1947 production was over 15 per cent higher than 1939 top capacity. This was due to forced draft production, accomplished by the use of oxygen in blast furnaces and other expedients that decrease the life of equipment. The efforts toward utilizing the highest possible percentage of capacity do not reconcile the statements made by nationalization advocates. I do not agree that the steel industry can complacently stand by. It must try to meet the present situation with all its efforts. It is trying and under tremendous pressure to increase its capacity. It is spending millions of dollars at the present time on new plants.

But you can not have your cake and eat it too. Construction of these new plants requires a tremendous amount of steel. If we are going to build plants, we



Photos, courtesy Inland Steel Co.

are not going to put as much steel into our present critical peak-demand requirements. Two tons of steel are required for each ten tons of steel capacity and mills started now would not be ready for production for at least two years. This means postponement of very scarce goods, so vitally needed now to stop inflation.

Will new expensive mills be worth their cost five years from now? Memory need not be stretched too far to recall the idle ghost mills of a few years ago.

Even if labor, now scarce in the steel areas, were plentiful, scrap is critical. You will remember that during the early 1930's the steel mills could not use all the scrap. It was shipped to Europe and to Japan in vast quantities. Shortage of both scrap and good coke were bottlenecks last year and continue as the greatest problems this year. The herculean efforts being made by the industry to get scrap is a story in itself.

Remember the scrap drives during the war? We searched for every ounce of scrap obtainable. Questionable items were thrown into the drive to help the war effort. Much of the scrap was melted and shipped in finished armament and other goods to foreign countries. Normally, scrap steel is re-melted and used over and over again as obsolescense relegates what was once modern into the scrap heap. Most of these scrap resources shipped out of this country prior to and during the war are lost forever.

Not only have we lost three millions of tons of scrap steel, but our iron ore reserves too are depleting quite rapidly. Three-fourths of our iron ore comes from the Great Lakes region and these deposits are rapidly approaching depletion. Only one steel company has enough iron ore in reserve for more than 20 years at

A Sales Manual With Punch! (II)

This is the second and final installment of the sales manual written by Gene Brown, sales manager of Morrison Steel Products, and used extensively by that company. Mr. Brown covers his topics thoroughly and yet keeps his style light and refreshing.

KNOW YOUR PRODUCT! Know its operation, its controls, and accessories. Your prospect will have more confidence in you if you are well informed and able to pass along that information fluently and intelligently. Avoid high pressure, phonograph-type sales routines. You are not selling gadgets—you are selling a vital necessity, and your customer is entitled to facts and figures instead of personality and pressure in large, fast doses.

If the average industry were blessed with the opportunities that we in the warm air furnace industry have, it would whoop and holler for joy, and get to work. We are missing the boat, boys, and if we don't get out and do a selling job, the wet heat outfits will be back on top. Look at our advantages—circulated air, with a mixture of outside fresh air if desired. Filtered air. Circulated humidification. Quick heat due to a direct fired heating surface—especially economical in uncertain spring and fall weather. Freedom from possibility of freeze ups. Summer air movement. In addition, the warm air system adapts itself to the increasingly popular cooling unit, to the electric dust remover and to the rapidly developing germicidal devices.

How many of these sales points do you use to best advantage? What can hot water radiant or panel heat offer to combat all these arguments? Probably you are overlooking some of these sales points in the manner of the fellow who couldn't see the forest for the trees, so let's look at this forest of opportunity we have—tree by tree.

THE REPLACEMENT MARKET covers those furnaces that have finally expired of old age. Many dealers depend entirely on the Replacement Market, and, sad to relate, most of them come under the alley tinner class—not because the Replacement Market is undesirable, but because the dealer will not take advantage of his opportunities.

An all too common practice when a dealer is called in on a replacement job is to check the size and offer to-lift the hood and slide in a new clunker of the same size and vintage. Maybe you can even patch up the casing and reuse it. You apologize for having to ask them \$95.00 for the job, but you will soften this terrible blow by allowing them \$10.00 for their 1916 model. If you are not guilty of that practice, Mr. Dealer, your alley competitor is—you can't beat his price, so you pass up the business. Why? It's good business—if you make it good. You are loaded to the gills with sound

arguments. Let's look some of them over. (As the idea is to replace worn out equipment with modern instead of similar furnaces, the Replacement differs from the Modernization Market mainly in the approach. However, we still prefer to treat each market separately.)

A good opener is to ask your prospect how he would like to add a nice, big, extra room to his house at little cost. A place for Junior to play in bad weather; a place for the Friday night poker games and the Saturday night parties. No worries about spilled drinks or cigarettes on the rugs. Darts, pingpong or pool. At Christmas the old man can set up Junior's train in this new roox..—so Junior can't get at it until the old man is tired of it.

Have some "before and after" recreation room pictures to show, but don't go into details on price or equipment yet. And don't be discouraged by preliminary protests of poverty because you are there to sell a modern heating plant.

Five will get you fifty that they have a fairly new thousand dollar car in their garage, and the auto salesman gets after them every year—he doesn't wait twenty years for them to come to him—and he doesn't sell them a new 1916 model either. He sells them a brand new model, complete with latest accessories and gadgets. He SELLS! Think of it—the auto salesman doesn't have an item indispensable to health and comfort to sell as you do, yet he gets so much more of the consumer's dollar than the heating man, it is unbelievable! Don't replace old obsolete equipment with new obsolete equipment—replace with new MODERN equipment. (We have already asked Mr. Brown to have

So sell! Tell Mrs. Jones about filtered air, showing and explaining how the dust tracked into the house is picked up by the filters instead of settling in rugs, drapes and upholstery to run up the cleaning bills. Remember, it's always dirt tracked into the house; Mrs. Jones will resent any insinuation against her housekeeping.

And don't forget to mention that filters will take a lot of irritating pollens out of the air—especially if the blower is run in a closed house during the hay fever season. Explain details of the blower, which is the item that makes flat ducts, filters, and corner of basement furnace installations possible. You can mention the blower's use for summer circulation—but don't misrepresent it as a cooling system.

The warm air heating market has three separate and distinct classifications, closely related in some ways, but requiring differences of approach. These classifications are as follows:



1. REPLACEMENT







3. MODERNIZATION

We are going to treat them as three separate chapters, each chapter complete in itself. There will necessarily be some repetition in using this method, but so much the better. Repetition will serve as emphasis.

Cost of electricity on a blower? Well, Mrs. Jones' refrigerator, vacuum sweeper and washer have motors. Would she go back to an icebox, broom and tub?

Humidity control is another feature to be explained in detail—point out how it prevents drying out of furniture, floors and woodwork in addition to the obvious benefits to the human throat. Emphasize that only in forced warm air can humidity be satisfactorily controlled.

By now, you should have determined the fuel preferred by or most suitable for the Jones', so you go into your equipment detail. Explain the controls, and how they affect the economy and comfort of heating plant operation. Use the manufacturer's bulletin, bound in your sales book, to point out each feature. Do not distract the prospect's attention by giving him a loose bulletin to look at during the interview.



Getting the name on the dotted line will come easier in your show room where the display units and business atmosphere will tend to create a buying mood. So load the Jones' in your car and take them to your store as soon as you have their interest aroused. Work confidently and smoothly-and soon Joe the Gyp and his 1916 clunker will be forgotten. If you can't close on the first call because they insist on getting a competitor's price, remind them of the vast differences in heating plants, just as in clothing or other commodities. Impress on them that your figure is not a bidthat a bid is an invitation to improper installation. Remind them that the difference in cost between a competitive and a correct installation, when spread over a period of twenty to twenty-five years, is negligible, while the advantages in comfort, convenience and general satisfaction are immeasurable.

We have prepared a "Customer's Check Chart", showing in one column the specifications of your intended installation, and having other columns for the customer to use in filling in competitive specifications. An attempt has been made to word this chart in terms the average prospect will understand—maintain this non-technical language when filling out your portion of the Check Chart. When you leave a Check Chart with a prospect, write the date and time of your next appointment—and be there promptly to close the deal.

THE NEW HOUSE MARKET covers both owner-built houses and speculative projects, each with its separate problems. In owner-built houses, heating usually is the step-child. Mr. and Mrs. Jones establish a definite amount they intend to invest in a home, and so advise their architect. Then Mrs. Jones picks out a disproportionately expensive bathroom and kitchen, adds a cute breakfast nook, and must have that flagstone terrace. and pretty soon the budget is all used up when suddenly someone remembers the heating plant. "Oh! yes," the Jones' say vaguely, "We must have a heating plant, but we simply can't increase our budget-put in the best you can." So the architect, to be a good fellow, puts in the best he can. After all, the Jones' friends are possible future customers of the architect, and fancy bathrooms and kitchens are better ads than

Understand, this isn't standard practice, but it is being done—and too often. We don't blame the Jones', we don't blame the architect. We blame the heating contractor.

It is necessary that the Jones' be contacted in the early stages of their planning, and impressed with the importance of allocating the proper proportion of their budget to heating. Just look what you have to back you up! Health, comfort, convenience, economy, long life—all these solid arguments to bring you your just share of the Jones' dollar. Perhaps the Jones' have been reading the current publicity about radiant heat. Radiant heat is okay—if it is heat only they want. But radiant heat will not give them ventilation, circulation, filtering, humidification; nor the chance to install a cooling unit or germicidal lamp. And in case of heating plant failure for any cause, there will be no disastrous freeze ups in a warm air system.

You will find a willing ally in most architects, if you offer cooperation, for they know that unnecessarily expensive fixtures are soon taken for granted, while an unsatisfactory heating plant becomes a permanent headache for all concerned. Remind the Jones' to build their home around their heating plant.

THE NEW HOUSE MARKET—SPECULATIVE. "I'm putting up fifty houses—I've allowed \$175.00 for heating and sheet metal. Do you want the job?" How many sheet metal men have cussed out this particular class of speculative builder for this practice—then have taken the job on the basis of installing whatever they could to make a few dollars at that price?

Who is to blame for this condition? Unquestionably, it is the heating contractor. What can he do to change this condition? Well, the simple way would be for every heating contractor to turn down this type of business, but that ideal solution is hard to manage. The building contractor can always find a weak sister, or even organize his own dummy sheet metal shop.

The logical answer is to do the builder a favor by making him aware of the sales advantages he will have in installing an adequate heating plant. If Zilch Building Company in the next sub-division is selling houses for \$5950.00, the Zero Construction Company is not going to simplify its selling job by cutting down the furnace and fittings still more so they can sell for \$25.00 under Zilch. Zero can make more profit and

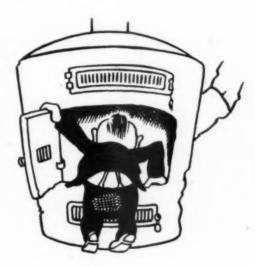
make his sales job easier—to say nothing of eventual good will, by properly installing modern heating. It's your job to convince the builder that he can sell for more if he uses a good heating plant as a sales feature.

Another important possibility in the speculative field is that of selling home owners on additional heating facilities. Suppose you have a contract to install gravity coal furnaces in a project. As a general rule, these houses are sold while still in the blue print stage, or in the early stages of construction. By getting purchasers' names from the contractor, you can approach the owner with the idea of changing to forced air, oil fired, or gas fired units. You will find your percentage of sales in this field remarkably high. Don't pass it up.

THE MODERNIZATION MARKET. And now we come to the Great Untouched—a vast, limitless market that the heating contractor treats like a barren desert. A desert it may appear, but a little irrigation will make it blossom into a garden of profits.

Take any square block of homes in your town. How many of these homes have modern heating plants? Maybe some of them have a furnace that keeps most of the house warm if fired often enough, but you will find very few adequate plants, and practically no modern plants. Take block after block, town after town, and you will find the same condition—the same fertile field for a job of selling.

It's really the best and largest market of all. It isn't competitive in comparison with the New, or even the Replacement Market. The only bad feature about it is that we look at the possibilities and realize the hopelessness of getting around to all of it. The problem is not in getting started, but in deciding where you want to start.



How can you approach this market? There are a number of methods. We, personally, consider the door bell ringing method a little cold, although some firms have worked out personal touches that have brought good results, such as presenting a small advertising piece—a thermometer, fuel record or fuel saving instruction chart. An exchange of prospects can be made with appliance dealers, roofing and siding outfits, and fuel oil companies. Public records, 'phone books and

city directories are sources of supply for names. A mailing piece should be sent out before calls are made—the manufacturer will be glad to supply these, but he will remind you that sales literature does no one any good when left on your shelf.

Many firms have had consistent success with small but frequent newspaper ads. Others have found that spot radio announcements have paid excellent dividends. Your manufacturer will furnish copy for your ads if you so desire.

One of your best sources of supply for prospects is your list of satisfied customers. Call on them occasionally to ask if they are pleased with their equipment and service. If you have done the right kind of installation job, their answer will be "Yes", and it will be no trick at all to get the names of their friends who might be interested.

When calling on a prospect, don't be discouraged by the statement, "Our furnace is all right." Mrs. Jones'



carpet sweeper was "all right"—but a salesman sold her a vacuum cleaner. Her wash tubs, icebox, iron, egg beater, toaster, waffle iron, radio and automobile were "all right"—but a salesman sold her modern equipment. Let's get in this selling game. We've been in the "come and get it" class too long.

Your opportunities are unlimited. It's time to go hunting—you have a year 'round open season.

Here's another important Modernization Market. Remember those victory installations you made during the war emergency? They have served their purpose—replace them with modern plants as soon as possible. This is one of your best bets.

Your actual sales talk for the Modernization Market will be similar to Replacement—an extra room, filtered humidified air, summer circulation. Health, comfort, convenience, economy. What a batch of ammunition!

Maybe you can't swing a deal for an entire new heating installation. Sell them a blower filter unit, and raise that long run to the back bedroom that never did heat; and, besides, Mr. Jones is always bouncing his head off of it and teaching Junior naughty words,

* (Please turn to page 186)

NEWS SUMMARY OF THE MONTH

Warm Air Furnace Shipments

FACTORY SHIPMENTS OF WARM AIR FURNACES in June totaled 64,724, the highest level recorded since December 1947, according to the Bureau of the Census, Department of Commerce. This represented an increase of 17 per cent above the 55,473 units shipped in May and a similar increase over the number shipped in June of last year.

June shipments of 35,532 solid fuel furnaces showed an increase of 16 per cent above the number shipped in May. Shipments of 17,327 gas fired furnaces represented a 27 per cent increase and shipments of 12,050 oil fired furnaces were 6 per cent above the May level. The 102,172 warm air furnaces remaining in inventory at the end of June were 5 per cent lower than the May 31 stocks.

New Housing Bill

THE HOUSING BILL passed at the special session of Congress contains a number of important provisions that will affect the availability of low-cost houses. The new law:

- Authorizes the federal housing administration to guarantee loans for states and municipalities and nonprofit corporations which are building rental housing.
- Provides an additional \$800 million authorization for insurance of loans on large scale rental units.
- Liberalizes loans to makers of prefabricated houses.
- 4) Provides for construction loans of 80 per cent on homes costing \$7,500 or less where at least 25 homes are built in the same project.
- Authorizes 95 per cent buyers' loans and 90 per cent construction loans on homes costing up to \$6,300.
- 6) Provides for loans to veterans co-operatives.
- Makes available an additional \$350 million in loans for construction of rural homes costing up to \$4.500.
- Guarantees a return of 2.75 per cent to investors in low rental housing developments.
- Provides government research and development of standardized building codes.

Curbs on Inflation

THE ATTACK ON INFLATION by the government and its agencies is taking shape as a four-way drive to make the process of borrowing money more difficult and more expensive for private corporations and individuals.

These methods are: 1) raising the interest rate in short term government securities; 2) increasing bank reserve requirements; 3) increasing rediscount rates

and 4) restoring controls over instalment credit.

The controls on instalment credit have taken a form a little less harsh than those embraced in Regulation W. Automobiles may be purchased with a down payment of one-third and the balance must be paid within 18 months. Radios, refrigerators, appliances and like consumer items will require a twenty per cent down payment and a similar payment period.

Professor Miller Promoted

PROFESSOR LORIN G. MILLER of Michigan State College, well known director of the Short Course, has been made dean of his department at the college. Formerly professor and head of the Mechanical Engineering Department, he has replaced Henry B. Dirks as Dean of Engineering and director of the Engineering Experiment Station.

Professor Miller has been associated with Michigan State since 1929 and intends to continue his activities with the Short Course. He has announced that the college expects to expand its facilities in heating, ventilating and refrigeration in the near future.

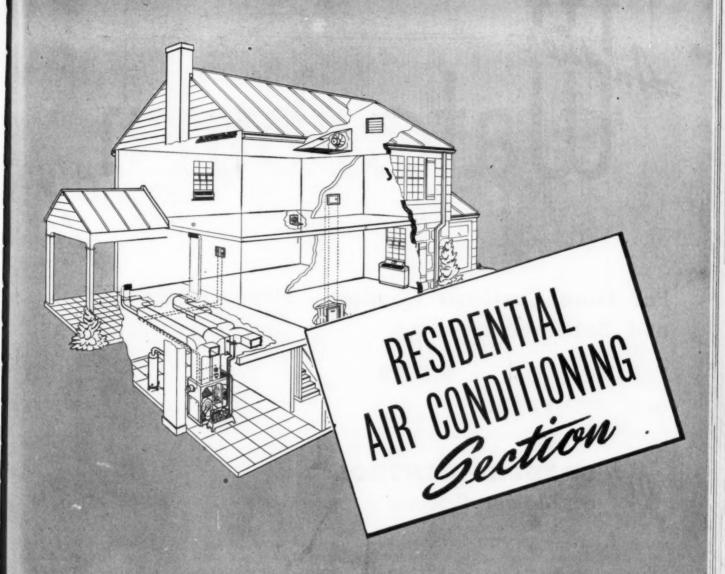
Gas Capacity Increase Sought

PEAK LOAD PROBLEMS have been a major concern of the Gas Production Research Program of the American Gas Association. Manufactured gas plants and large pipe line systems today are operating at capacity loads with demand for gas increasing. In many instances pipe lines are transporting natural gases containing 10 per cent or more of non-combustible nitrogen. Large reserves of natural gas have been developed in some areas which have been limited because of the low heating value resulting from high nitrogen contents. Removal of a large part of nitrogen from this natural gas would greatly increase the present capacity of these pipelines enabling them to carry a greater quantity of natural gas of higher heat value.

The U. S. Bureau of Mines and the American Gas Association have undertaken a cooperative study of the removal of nitrogen from natural gas. More than \$100,000 will be spent on a project intended to increase transmission capacity of natural gas pipe lines and to improve marketability of natural gas containing noncombustible nitrogen.

The Bureau of Mines is interested in nitrogen removal because of its close association with operating problems at the Bureau's helium plants. The American Gas Association has undertaken this project as one phase of its expanded Research Program which calls for expenditures of \$1,800,000 over a three year period, on the problems of gas production and utilization.

(Please turn to page 155)



INDOOR COMFORT - IN ALL SEASONS
FOR HOMES AND SMALL BUSINESSES

Waterbury,"

For More Customer Comfort and Satisfaction—

For More Dealer SALES and PROFITS!

GRADUAL CONTROL of Blower Speeds



Now Standard Equipment on All Waterbury Air Conditioners*

THE MASTER BLOWERTROL

After extensive tests by our Engineering Department we are convinced that the Master Blowertrol is the best means of achieving TRUE continuous blower operation. From a cold start it expels the cool air from the ducts so gently that the occupants of the rooms are not aware of any draft. It gradually builds up speed until the thermostat is satisfied and then decreases until just a light movement of warm air is coming from the registers. With the new Blowertrol equipped Waterburys, stratification and "cold 70" are things of the past.

Now there's an added reason for saying-

"It's What's Under the Casing that Counts"

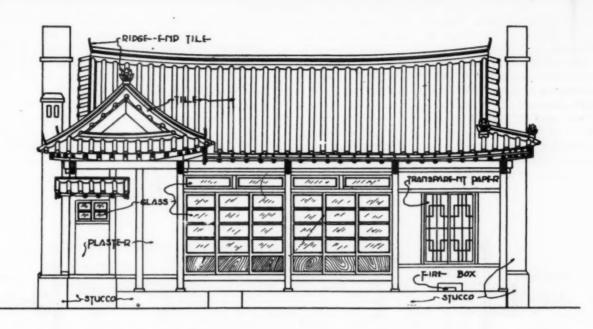
*With a Blower Motor of 1/2 h.p. or less.

THE WATERMAN-WATERBURY COMPANY

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ONDOL = Radiant Heating in Korea

WARREN VIESSMAN Mechanical Engineer, U. S. Army, Seoul, Korea An old saying proclaims that there is nothing new under the sun and this article adds further proof to the antiquity of radiant heating. Evidence indicates that radiant heating was introduced into Korea 13 centuries ago. And here the American buying public thought it was a startling post-World War II development!

The object of heating living spaces is to provide healthful and comfortable conditions. Heat is transferred between bodies by one or all of three means; direct contact, known as conduction; circulating currents of gases or liquids known as convection; and by direct radiation, similar to light rays, which pass from solid object to solid object without heating the intervening air space. The amount of radiation produced depends on a number of factors including the fourth power of the temperature difference. This latter method of heat transfer will be discussed here, with particular reference to phases of its historical development and its present day use in the Korean warm floor radiant heating systems.

Body Comfort Conditions

Healthful comfort requires that heat shall escape from the human body at the same rate it is generated. If the surrounding temperature is too low, heat escapes more rapidly than it is generated, and the person feels cold. On the other hand, if the surrounding temperature and humidity are too high, insufficient heat escapes by respiration, perspiration, radiation and convection, and the body feels uncomfortably hot. A total heat of about 400 British thermal units is generated per hour by a person at rest in an ambient temperature of 70 F. The amount of clothing worn is a controlling factor in the dissipation of the body heat either by radiation or convection air currents.

About one-fourth of this body heat is dissipated in

evaporation. Of the remaining three-fourths, about two-thirds are dissipated by radiation and one-third by convection. When this ratio of radiation and convection is approximated at the proper level of temperature and humidity, the person is most comfortable. This accounts for the high degree of comfort experienced in properly designed radiant heating systems.

Today, because of architectural, physiological, and economic advantages, the radiant heating of dwellings, living and working spaces, has received ever increasing popularity throughout the world.

Radiant Heat in U.S.

In the United States radiant heating became firmly established with the first noteworthy installations of a small village school at Glen Park, Indiana, in 1909; certain rooms in the Phipps Psychiatric Clinic of the Johns Hopkins Hospital at Baltimore, Maryland in 1911; and a large Chicago, Illinois garage in 1912. There are now perhaps three thousand installations in the United States, mostly of the pipe coil, forced hot water circulation type, although there are some closed warm air radiant systems, and some semi-radiant convection systems in which the warm air, after passing through a labyrinth of ducts in the floor, enters the room and is later returned to the heater.

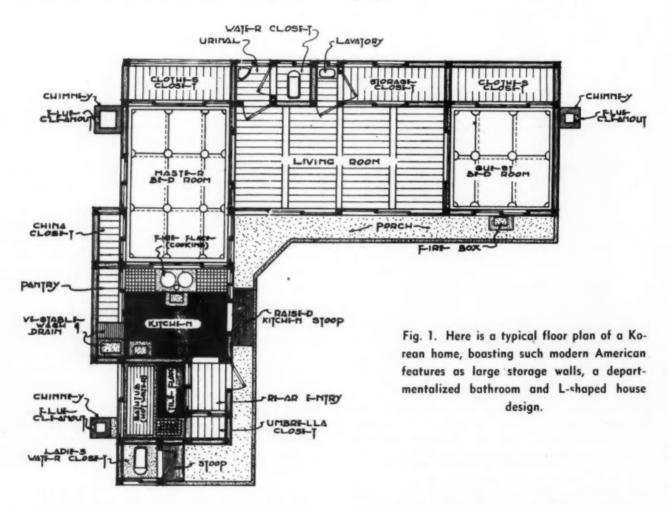
In England the radiant heating principle was rediscovered by Mr. A. H. Barker some forty years ago. Today in England and France there are about two

thousand installations, most of which are of the hot water coil type. The Bank of England is a notable example.

The use of radiant heat for space heating took place in England long before Mr. Barker's time. The Romans introduced it about 2000 years ago when it was used at Bath, England. In many parts of the Roman Empire it was used for cathedrals and large public buildings. Wood or charcoal was the fuel, and the products of combustion, warm air, and smoke, passed through stone chambers under the masonry floors. This arrangement was typical of all the early historical installations.

years ago, as there is evidence of such heating systems in some of the ancient structures and ruins of the Great Silla dynasty (668-935 AD). The system has been developed, improved and applied by the Koreans to meet the requirements of their climate and structures, and is known by the term "Ondol".

At first it was the property of the kings, and was used in palaces and government buildings. Later it was given to the people, although fear was expressed that living in heated houses, sitting and sleeping on warm floors, would make the people soft, and less hardy.



Coincident with the Roman construction, the Chinese used radiant heating in the same general manner, applying it to a chamber under the floor or along the side of a room. The heating spaces were originally formed of clay rather than stone.

Korean Culture

Korea, the Hermit Kingdom, or Land of the Morning Calm, has in the past looked to the East for its culture, and has acquired much from China. Her native architecture has been inspired by China, but has been modified and adapted to suit the climatic environment and character of the people, so that it has become indigenous to Korea.

The idea of warm floor radiant heating was perhaps introduced into Korea from China more than 1300

In the reign of King Inzo of the Li dynasty, about 350 years ago, the Ondol had reached great popularity, and the people were encouraged to use it to burn the twigs, pine needles, and brush in order to clean up the forests. Today the system is universally used in detached one story residences, but unfortunately the people have not only burned up the under brush in South Korea, but also the trees. Wood has become a scarce and expensive fuel. Coal, though available, is not a satisfactory substitute fuel for the Ondol, as the heat is too intense and prolonged, causing cracks to form in the masonry and permitting smoke and dangerous gases to escape into the room. The ducts also become clogged with coal soot and are difficult to clean. Because of its limitations with coal, its future depends on available wood fuel and reforestation.

A typical Korean home is shown on the drawings.

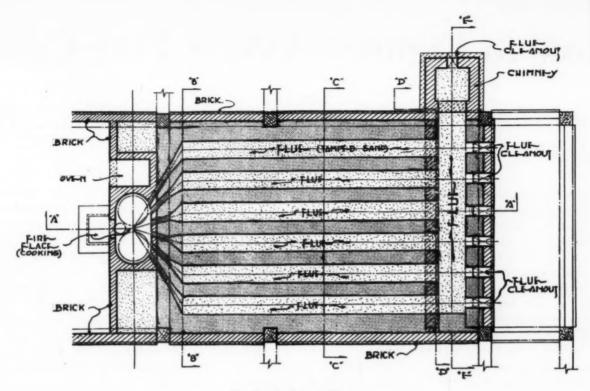


Fig. 2. Design of Heater

It is to be noted that the warm air spaces have been developed into a system of ducts, made of masonry. Underfloor radiant heating is applied only to the bedrooms and the bathroom. The ceilings are low, being about seven or eight feet high. The walls are made of wood frame construction, joined together with mortise and tenon joints, secured with wood pins, or wedges. The paneling within the framework is usually of wattle construction. That is a network of bamboo, twigs, and grasses, upon which is placed a mud plaster, with a hard troweled lime or cement stucco finish. In the poorer houses the tiled roof is replaced by a so-called grass roof made of rice straw. In the better homes the lower exterior walls are sometimes built up to window level with courses of stone or brick. Interiors are frequently papered.

An ingenious arrangement is commonly provided to utilize the same fire for cooking, and for heating one of the bedrooms, usually the master bedroom. This room is used during the day, in cold weather, as a sitting, eating and work room.

In the bathroom the tub is of concrete or stone, and partially recessed in the floor. The water is heated by the hot gases of the bathroom heater passing under the tub. In the oriental home, outside of the large cities, the tub is normally filled and emptied by the aid of pails.

Small Fires Used

Only several small wood fires are made a day, usually at meal times, to heat the rooms, as the stones retain their heat for a long time, and a prolonged fire, or too great a fire would make the floor uncomfortable. The smoke flues or ducts are provided with cleanouts for ready cleaning as shown on the radiant heater detail. After combustion of the fuel, the heat is prolonged in the system, by tightly sealing the air inlet. When this

(Please turn to page 178)

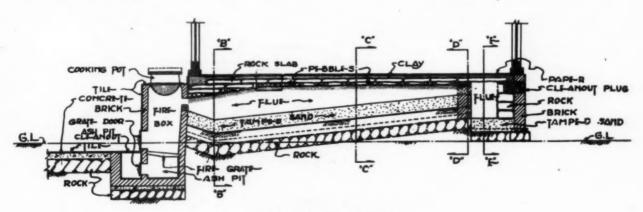


Fig. 3. Floor Construction

How to Figure-Annual Fuel Costs

JACK KICE

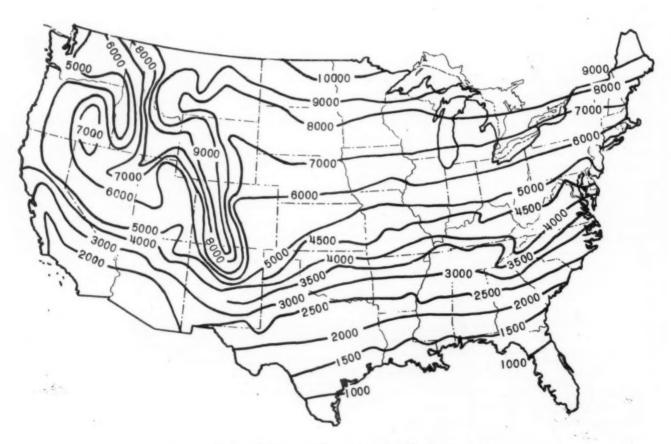
The Coleman Co., Inc. Wichita, Kansas

WITH the present high costs of every kind of fuel, customers are more interested than ever in "How much will my fuel bill be?" Questions about fuel cost are impossible to answer definitely because of uncertain weather, different heating requirements of houses, the human element and many other variables. However, there is a method widely used by gas utilities, oil companies, and heating engineers that gives fairly accurate results based on average conditions. This is called the "Degree Day Method," which has been greatly simplified in the charts presented here.

The amount of fuel required to heat a given building any place in the United States is directly proportional to the Degree Days for the locality as shown on the map below. On the opposite page, the Comparable Fuel Price gives the cost per million Btu's of heat for all types of fuels at various prices. This information helps to obtain the Annual Fuel Cost by merely drawing two straight lines from point to point on the chart according to the explanation.

To estimate yearly fuel costs, you must know the heat loss of the building as well as the degree days and fuel price. The heat loss can be estimated with a heating estimator slide rule. More accurate calculations can be made by following one of the accepted methods of calculation.

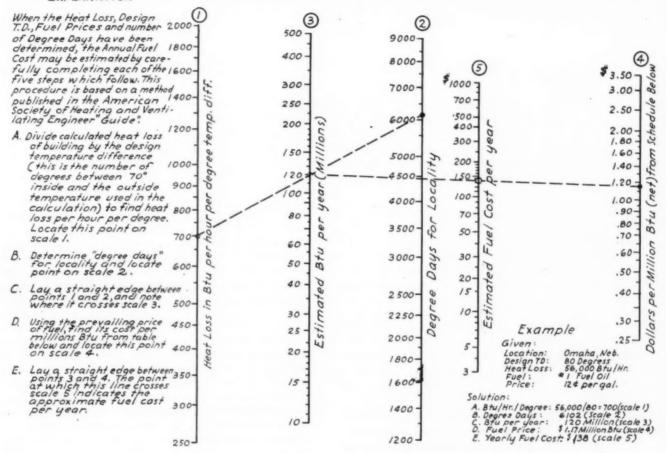
Referring to the map below, the degree days for your locality are indicated by the irregular lines drawn across the map. A city halfway between the 2,500 and 3,000 degree day lines would have about 2,750 degree days. Complete the estimate by using the charts on the opposite page.



Map of Degree Days in the U. S. A. Average Values Based on Weather Bureau Records

ANNUAL FUEL COSTS

EXPLANATION



		COMPA	RAE	BLE	F	UEL	_ A	PRI	CES	•		All :	fuel ,	price t per	es list	ted in	each	vert	ical c	top o	n are f col.
nits	- /	Firing	Dollars Per Million Btu (Net)																		
Uni	Fuel	Efficiency	.25	.30	.35	.40	.45	.50	.60	.70	.80	.90	1.00	1.20	1.40	1.60	1.80	2.00	2.50	3.00	3.50
0	Anthracite Coal	Stoker (60%)	4.05	4.86	5.67	6.48	7.29	8.10	9.72	//.34	12.96	14.58	16.20	19.44	22.68	25.92	29.16	32.40	40.50	48.50	56.70
70	(13,500 Btu/Lb.)	Hand (45%)	3.04	3.65	4.25	4.87	5.47	6.08	7.30	8.51	9.73	10,94	12.15	14.59	17.02	19.45	2/.88	24.3/	30.40	36.50	42.50
100	Bituminous Coal	Stoker (60%)	3.60	4.32	5.04	5.76	6.48	7.20	8.64	10.08	11.52	12.96	14.40	17,28	20.16	23.04	25.92	28,80	36.00	43.20	50.40
151	(12,000 Btu/Lb.)	Hand (45%)	2.70	3.24	3.78	4,32	4.86	5.40	6.48	7.56	8.64	9.72	10.80	12.96	15.12	17.28	19.44	21.60	27.00	32.40	37.80
1/10	Lignite Coal	Stoker (60%)	2.03	2.43	2.84	3.24	3.65	4.05	4.86	5.67	6.48	7.29	8.10	9.72	11.34	12.96	14.58	16.20	20.30	24.30	28.40
Do	(6,750 Btu/Lb)	Hand (45%)	1.52	1.82	2./2	2.43	2.73	3.03	3.63	4.24	4.85	5.45	6.08	7.29	8.51	9.73	10.93	12.15	15.19	18.20	2/.20
	Medium Oil No.3 (141,000 Btu/Gal.)	Top (75%)	2.6	3,2	3.7	4.2	4.8	5.3	6.3	7.4	8.5	9.5	10.6	12.7	14.8	76.9	19.0	2/.2	26.4	31.7	37.0
0		Average (65%)	2.3	2.8	3.2	3.7	4./	4.6	5.5	6.4	7.3	8.2	9.2	11.0	/2.8	14.7	16.5	/8.3	22.9	27.5	32.1
110	Light Oil No.1	Top (75%)	2.6	3.1	3.6	4.1	4.6	5.1	6.2	7.2	8.2	9.3	10.3	12.3	14.3	16.4	18.4	20.5	25.6	30.8	36.6
96	(137,000 Btu/ Gal.	Average (65%)	2.2	2.7	3./	3.6	4.0	4.5	5.4	6.3	7.2	8.0	8.9	10.7		14.2	16.0			26.8	
100	Butane	Top (80%)	2./	2.5	2.9	3.3	3.7	4.1	5.0	5.8	6.6	7.5	8.3	9.9	11.6	/3.3	15.0	16.5	20.7		
12	(103,700 Btu/Gal.)	Average(70%)	1.8	2.2	2.5	2.9	3.2	3.6	4.4	5.1	5.8	6.5	7.3	8.7	10.2	11.7	/3.2	14.5	-	21.9	
no.	Propane	Top (80%)	1.8	2.2	2.5	3.0	3.3	3.7	4.4	5.1	5.9	6.7	7.3	8.8	10.3	11.7	13.2	14.6	18.3	22.0	
_	(91,750 Btu/Gal.)	Average (70%)	1.6	1.9	2.3	2.5	2.9	3.2	3.8	4.5	5.0	5.8	6.4	7.7	9.0	10.2		/2.8	16.1		22.6
×	Natural Gas	Top (80%	20.0	24.0	28.0	32.0	36.0	40.0	48.0	56.0	64.0	72.0	80.0	96.0				160.0			
Cu.t	Mixed Gas	Average(70%)	17.5	21.0	24.5	28.0	31.5	35.0	42.0	49.0	56.0	63.0	70.0	84.0			_	140.0			
0		Top (80%)							_		51.2				-			128.0			
100	(800 Btu/cu.ft.)	Average (70%)																112.0		-	196.0
154	Manufactured Gas	Top (80%)													61.6	70.4	79.2	-		132.0	
Cen	(550 Btu/cu.ft.)	Average (70%)	9.6	11.4	13.3	15.2	17.1	19.0	22.8	26.6	30.4	34.2	38.0	45.6	53.2	60.8	68.4	76.0	96.3	114.0	133.0
Electricity - 100% Efficiency Cents per Kwh - 3,412 Btu				_ /	10-	-	-	_ 2	110	-	-	3/10	, -	+ 4	10-	1/2	- 6	110-	7/10	14	170

Fuel Oil Pump Characteristics

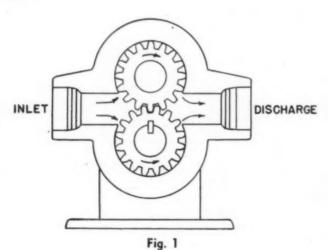
WARREN E. WILSON

President, South Dakota School of Mines & Technology

The modern pressure type oil burner is highly dependent upon the performance and efficiency of the fuel oil pump and yet the pump is often omitted in literature on oil heating. In this article the author presents an excellent description and analysis of the fuel oil pump, its construction and performance.

ONE of the components frequently neglected in discussions of domestic oil burners and their service characteristics is the fuel oil pump. These are usually rotary pumps of the positive displacement type. As shown in the drawing (Fig. 1) this type of pump uses a set of rotating gears which have very close clearances with the casing and form a fluidtight joint where the teeth contact. After the pump has been primed, liquid flows between the gear teeth on the inlet side and as the gears rotate this fluid is trapped between the teeth and the casing and carried around to the discharge side. Since the liquid cannot escape back to the inlet side, a pressure is built up which forces it into the nozzle pipe.

Before proceeding with an analysis of the characteristics of the fuel pump and its operation, let us visualize the place of the pump in the supply system for the oil burner. The simplest type of circuit is shown in Fig. 2, a one line circuit with a single stage pump. In this particular case there is a positive pressure at the inlet side of the fuel pump due to the elevated position of the fuel level in the tank. In operation, the pump draws fuel from the tank through the supply line and pumps it to the nozzle and the relief valve (commonly known as the pressure regulating valve) which governs the pressure maintained on the discharge side of the pump.



The by-pass circuit and pressure regulating valve (relief valve) shown in the drawing are generally incorporated in the fuel pump unit and so require only the tank connection for immediate operation. When the pump is of this type internal by-pass is the term used and the internal by-pass plug must be removed when such a pump is installed on a one line system.

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Circuit and Pump Characteristics

Having described the simplest basic piping system and established the fuel pump's position therein, let us take up the requirements which must be met by the circuit and the fuel pump. Varying conditions of installation of the oil burner may call for performance characteristics that demand the use of more complicated systems than the one illustrated. Safety in operation calls for a sharp cut-off of flow and rapid priming. A constant rate of flow is made possible by the pressure regulating valve. Pressure conditions at the inlet and the necessity for by-passing surplus oil to eliminate air entrainment may lead to the need for two stage pumps and two line systems.

Operation of the oil burner calls for the performance of certain functions by the entire piping circuit. It must connect the fuel storage tank and the pump; the pump and the fuel spray nozzle. Fuel must be supplied at a constant pressure, assuring a constant rate of flow through the nozzle. Priming within a specified time must be assured. Design of the circuit should avoid long intake lines and high lifts where possible, to ease the strain on the pump. Air or vapor bubbles must be eliminated from the discharge line to prevent pounding and dripping after shut-off.

The pump itself must meet exacting requirements. It must be: capable of delivering fuel at the rate called for by the burner; capable of developing the pressure required to force the liquid through the nozzle at the desired rate; self-priming; quiet and durable.

What the Pump Is and Does

As indicated above, the fuel pump of the positive displacement type carries a fixed volume of liquid from inlet to outlet at each revolution of the drive shaft (Fig. 1). This action is positive in nature and assures delivery of the trapped volume, regardless of pressure. The volume displaced per revolution is the total vol-

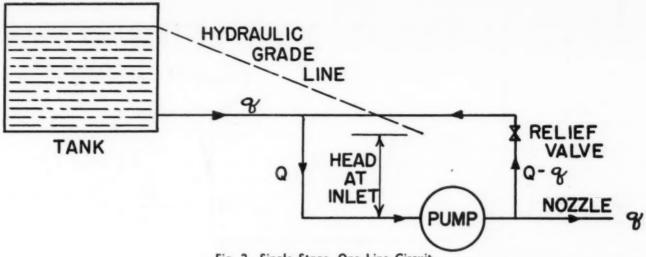


Fig. 2. Single Stage, One Line Circuit

ume of liquid confined between the gear teeth and the housing. Since the backflow (slip) is relatively small, the delivery of the pump is nearly constant, when operated at constant speed. This delivery increases directly with the speed at constant pressure and decreases directly with the pressure at constant speed. The well-designed pump will show only a slight decrease in delivery with an increase in pressure.

The pressure developed by the fuel pump depends on the rate at which liquid is being pumped and the nature of the discharge line. If the discharge line is large in diameter, short and straight, it offers little resistance to fluid flow, hence the pressure required to force the liquid through the line is small. On the other hand, if the line is small in diameter, long and changes direction frequently, it will obviously require greater pressure to deliver the same volume of liquid.

The rotary pump is so constructed that it will force the liquid through the pump no matter what the restriction and whatever pressure is needed will be developed. If a valve in the discharge line is closed the pressure will build up until something fails or slip exactly equals the displacement and there is no net delivery.

The intake process of the fuel pump differs from the discharge since it is not a positive displacement action. As the liquid moves from the inlet to the discharge, a void is created in the inlet region. The result is a low pressure area that will be filled if there is a high pressure area on the supply side. This low pressure at the inlet combined with atmospheric pressure on the surface of the liquid in storage results in a pressure differential which forces the oil through the pipe to the pump inlet. Priming of the pump can only take place if there is a pressure difference between the storage tank and the pump intake.

Since the rotary pump is capable of pumping gas it can prime itself from a dry start. However, the pressure differential which can be created at any given speed of rotation, by pumping air out of the intake line, depends on the effectiveness of the seal between inlet and discharge sides of the pump. Air pumping will continue until slip (due to pressure difference across the pump) exactly equals the rate at which air

is being pumped. If the resulting drop in inlet pressure head is less than the vertical lift of the liquid, the pump will not prime. But if this inlet "vacuum" is equivalent to a head greater than the vertical lift, the pump primes.

After the pump has primed and the flow started in the intake line, the pressure drop in the line and the physical constitution of the liquid determine the delivery characteristics.

Air Bubbles Are Serious

Air entrained or dissolved in the oil has a very serious effect on delivery if the pressure in the inlet region is low. This air forms bubbles which expand in the low pressure area and occupy space that should be taken up by liquid. This mixture of oil and air is transported through the pump and when it enters the positive pressure region decreases in volume due to the collapse of the air pockets. When this happens the pump delivers less than rated capacity and pounding develops that is noisy and destructive.

The suction at the pump inlet depends on the rate at which liquid flows through the intake line, the resistance of the line, the vertical distance from the surface of the liquid to the pump intake and the pressure on the liquid surface (usually atmospheric). The reduction in inlet pressure is illustrated schematically in Fig. 2. The hydraulic grade line is a measure of the pressure in the pipe at any point. The elevation of this line above a designated point is the absolute pressure in the pipe at that point.

The rotary pump, by nature, is a tightly fitted mechanism and its performance is affected by wear due to abrasion from foreign material and the friction resulting from metal moving on metal. The effect on performance shows up in two ways; first, the wear on the adjacent surfaces causes a reduction in delivery due to increased slip; secondly, wearing of surfaces results in increased friction with a resultant increase in waste of mechanical energy due to conversion to heat.

Noise of operation is a frequent fault in fuel pumps and is generally due to one of two causes. Air bubbles in the line produce noise and they have been discussed above. The other common source is the trapping of oil

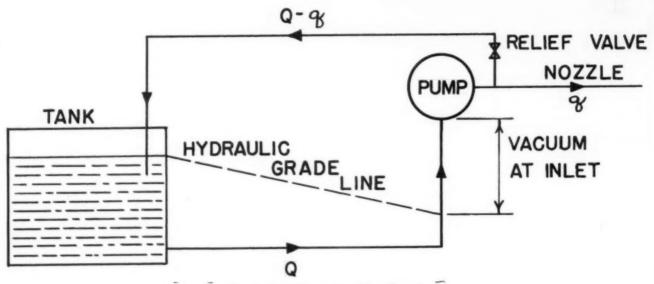


Fig. 3. One Stage, Two Line Circuit

at the meshing of the gears, caused by the change in volume of the space sealed off between adjacent meshing teeth. If proper relief is provided for the pressure created in the trapped oil, the noise will be abated. A well-designed gear pump should produce very little of this noise.

Conditions set up by the individual oil burner installation may make it necessary to use a more complicated fuel supply system than the one line, single stage pump system previously described. Furthermore, as already mentioned, it is necessary to maintain constant pressure at the nozzle in order to assure the nozzle's delivery of fuel at a constant rate. This is accomplished by supplying excess oil to the nozzle line and passing it through a pressure regulating valve, which maintains the required pressure and by-passes the oil not delivered to the nozzle. Inlet pressure conditions and the formation of air bubbles in the fuel line may make it necessary to use a two stage pump.

The two stage pump can most easily be visualized as it is shown in Fig. 4: two single stage units in series

(usually contained in a single housing). The by-pass line between the two stages provides a means of escape for the air or vapor bubbles formed in the first stage. The second stage receives liquid at, or near, atmospheric pressure and free of bubbles.

The single line circuit (Fig. 2) by-passes the excess liquid from the nozzle line to the pump inlet. If the pump inlet is at or above atmospheric pressure, this process is feasible since the by-passed oil is at atmospheric pressure.

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If the intake is at sub-atmospheric pressure, the line may not be opened to atmospheric pressure to receive the by-passed oil since this would break the vacuum and so stop the intake process. Under such conditions it is necessary to return the oil to the tank by means of the two line circuit. In Fig. 3 and 4 are shown two variations of the two line circuit, one using a single stage pump and the other a two stage pump.

As indicated, the two line circuit is required if the pump inlet pressure is below atmospheric. The single (Please turn to page 184)

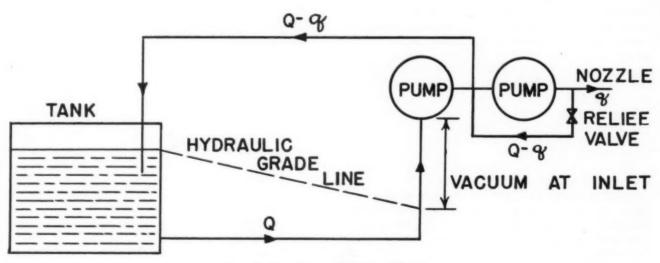


Fig. 4. Two Stage, Two Line Circuit

UNDERWRITERS OK ALUMINUM DUCTWORK

George W. Booth, chief engineer of the National Board of Fire Underwriters, states in a letter to the editors, "Certain statements have been spread around and published in newspapers to the effect that aluminum ducts are not permissible under the standards of the NBFU, but such statements have been erroneous."

Revisions are being made in NBFU pamphlet No. 90, Standards for the installation of Air Conditioning, Warm Air Heating, Air Cooling and Ventilating Systems. A number of these refer to the use of aluminum for ductwork; certain other revisions are included here because of their importance to the installer of the systems named.

Add the following new paragraph:

103. It is recommended that in buildings, especially of the windowless type, where the panic hazard is pronounced, means be provided for mechanically removing smoke. Such smoke removal systems may incorporate such portions of air conditioning, heating, ventilating or exhaust systems as may be adapted to the purpose. It is important that the system be arranged to keep smoke away from exitways.

In the absence of more definite data, it is recommended that the smoke exhaust equipment have a capacity approximating a ten minute air change.

111. Ducts shall be constructed entirely of noncombustible material, such as iron, steel or other approved material.

Paragraph 111. Insert the word "aluminum" after the word "steel."

114. (a) Only fire-resistive linings acceptable to the inspection department having jurisdiction shall be used inside of ducts.

TABLE 1.—RECOMMENDED SHEET METAL GAGES FOR RECTANGULAR DUCT CONSTRUCTION.a

U.S. Std. Gage	1 5	fax nur Side nch	n e,	Type of Transverse Joint Connections b	Bracing				
26	Up	to	12	S, drive, pocket or bar slips, on 7 ft. 10 in. centers	None				
24	13	to	24	S, drive, pocket or bar slips, on 7 ft. 10 in. centers	None				

24	25	to	30	S, drive, 1 in. pocket or 1 in. bar slips, on 7 ft. 10 in. centers c	$1 \times 1 \times \frac{1}{8}$ in. angles, 4 ft. from joint
22	31	to	40	Drive, 1 in. pocket or 1 in. bar slips, on 7 ft. 10 in. centers c	$1 \times 1 \times \frac{1}{8}$ in. angles, 4 ft. from joint
22	41	to	60	1½ in. angle connections, or 1½ in. pocket or 1½ in. bar slips with 1¾ x ⅓ in. bar reinforcing on 7 ft. 10 in. centers c	$1\frac{1}{2} \times 1\frac{1}{2} \times \frac{1}{8}$ in angles, 4 ft. from joint
20	61	to		1½ in. angle connections, or 1½ in. pocket or 1½ in. bar slips 3 ft. 9 in. maximum centers with 1¾ x ½ in. bar reinforcing	1½ x 1½ x ⅓ in diagonal angles or 1½ x 1½ x ⅓ in. angles 2 ft. from joint
18	91 8	and	up	2 in. angle connections or 1½ in. pocket or 1½ in. bar slips 3 ft. 9 in. maximum centers with 13% x ½ in.	$1\frac{1}{2} \times 1\frac{1}{2} \times \frac{1}{8}$ in diagonal angles or $1\frac{1}{2} \times 1\frac{1}{2} \times \frac{1}{8}$ in. angles, 2 ft. from joint

a For normal pressures and velocities utilized in typical ventilating and air conditioning systems. Where special rigidity or stiffness is required, ducts should be constructed of metal two gages heavier. All uninsulated ducts 18 in. and larger should be cross-broken. Cross-breaking may be omitted on uninsulated ducts if two gages of heavier metal is used.

bar reinforcing d

b Other joint connections of equivalent mechanical strength and air tightness may be used.

c Duct sections of 3 ft. 9 in. may be used with bracing angles omitted, instead of 7 ft. 10 in. lengths with joints indicated.

d Ducts 91 in. and larger require special study for hanging and supporting methods.

(b) Combustible coverings or combustible exterior insulations to ducts are not recommended and should not be used generally, particularly in concealed locations of non-fire-resistive construction, unless covered with a cement or gypsum plaster coating of ¼-inch thickness. On ducts with entering air temperatures exceeding 175° F. combustible coverings shall not be used.

Paragraph 114. Revise Table 1 by adding a new column giving minimum metal gauges for aluminum ducts, and inserting the word "Steel" in heading of the column now headed, U. S. Std. Gauge.

		1	
Aluminum,	Steel,	Maximum	
B & S	U. S. Std.	Side,	
Gauge	Gauge	Inches	
24	26	Up to 12	
22	24	13 to 24	
22	24	25 to 30	Remainder of
20	22	31 to 40	Table—No
20	22	41 to 60	change from
18	20	61 to 90	last edition
16	18	91 and up	

116. Ducts shall be so constructed as to provide structural strength and durability at least the equivalent of galvanized sheet iron or steel of the thickness specified in Table 1. Wired glass may be used for inspection windows in ducts.

Round ducts should be constructed of metal of the same gage as specified for rectangular ducts of the same cross sectional area, e.g., a round duct up to 13 in. dia. should be of 26 gage metal, up to $33\frac{1}{2}$ in. dia. should be 24 gage, and up to $67\frac{1}{2}$ in. dia. should be 22 gage.

Paragraph 116. Revised to read as follows:

116. Ducts shall be so constructed as to provide structural strength and durability at least the equivalent of materials of the thicknesses specified in Table 1. Wired glass may be used for inspection windows in ducts.

Round ducts should be constructed of metal of the same gauge as specified for rectangular ducts of the same cross sectional area, e.g., a round duct up to 13 in. dia. should be of 26 U. S. Standard Gauge for steel, 24 B & S Gauge for aluminum, up to 33½ in. dia. should be 24 U. S. Standard Gauge for steel, 22 B & S Gauge for aluminum and up to 67½ in. dia. should be 22 U. S. Standard Gauge for steel, 20 B & S Gauge for aluminum.

Aluminum, cadmium plated, zinc coated or other approved non-corrosive material for hardware or fastenings (sheet metal screws, rivets, nuts, bolts, etc.) should be used in fabrication and erection of aluminum duct work.

125. No attic or concealed space in a building shall be used as an integral part of a duct system unless it conforms to all the requirements for ducts. Such arrangements shall be subject to the approval of the

inspection department having jurisdiction. Plenum chambers which conform to all the requirements for ducts may be located in any such portion of the building; such chambers shall not be used for storage or occupational purposes.

Designate Paragraph 125 as 125 (a) and revise the first sentence to read:

No attic, basement or concealed space in a building shall be used as an integral part of a duct system unless it conforms to all the requirements for ducts.

Add the following new paragraph:

125(b). Public exit halls in hotels, hospitals, institutions and similar occupancies and in multi-family houses shall not be used as plenums.

Note: Institutions are defined as buildings or portions of buildings in which persons are harbored to receive medical, charitable or other care or treatment or in which persons are held or detained by reason of public or civic duty, such as asylums, sanitariums, police stations and jails.

NOTE: The word "plenum" as used in paragraph 125(b) means an air compartment or chamber to which one or more ducts are connected and which forms part of the air distribution system.

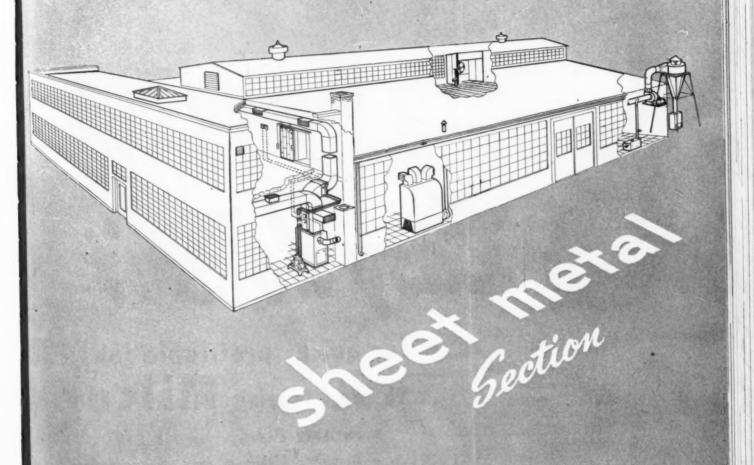
132. Fire dampers installed in the system, as required at other than fire wall openings, shall be No. 16 U. S. gauge metal on ducts up to 18 inches in diameter or greatest width, No. 12 U. S. gauge on diameters up to 36 inches or greatest width and No. 7 U. S. gauge on ducts above 36 inches in width. Louvered type automatic dampers as shown in Fig. 6 may be constructed of No. 18 U. S. gauge metal, provided the individual louvers are not over 6 inches in width and are stiffened by formed edges. One-half inch approved rigid asbestos sheet material may be used at points where metal dampers are specified, when permission of inspection department having jurisdiction is granted.

Paragraph 132. Revised to read as follows:

132. Fire dampers, installed in the system, as required at other than fire wall openings, shall be No. 16 U. S. Gauge steel in ducts up to 18 in. in diameter or greatest width, No. 12 U. S. Gauge on diameters up to 36 in. or greatest width and No. 7 U. S. Gauge on ducts above 36 in. in diameter or greatest width. Louvered type automatic dampers as shown in Fig. 6 may be constructed of No. 18 U. S. Gauge steel, provided the individual louvers are not over 6 in. in width and are stiffened by formed edges. One-half inch approved rigid asbestos sheet material may be used at points where steel dampers are specified, when permission of the inspection department having jurisdiction is granted.

- 135. Approved dampers shall be provided as follows:
- (a) Where duct systems serve two or more floors, approved fire dampers shall be required at each direct outlet or inlet and in each branch duct at its junction with the main vertical duct. Dampers are not required at room openings in the branch duct.

(Please turn to page 188)



DESIGN . FABRICATION . INSTALLATION OF SHEET METAL PRODUCTS





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Sheet Metalis Vital

The Sheet Metal Contractor's Essential Services
To American Industry Are Shown on these pages.
He must have steel!



J. H. Walters & Co. shop

S HOP Superintendent Clarence Hausafus, whose experience and technical knowledge were an important asset of J. H. Walters and Company in the successful completion of the sheet metal project in the Russell Miller Milling Company plant, has been in the sheet metal industry 22 years. All the modernized and improved fittings and methods of fabrication for this complex installation were laid out on his drafting board.





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In Modern Flour Mills — Sheet Metal Is Sanitary & Flexible

THE Russell Miller Milling Company flour mill at Alton, Illinois, is an outstanding example of the sheet metal industry's vital role in industry, in this case food. Here 15,000 bushels of wheat daily are ground, sifted, blended, enriched, and packaged into nationally known Occident flour. Sheet metal spouting, troughs, and fittings become the arteries through which a universally basic food reaches grinders, sifters, hoppers, and other specialized equipment required today to attain production efficiency and sanitation. The uninitiated quickly realizes that modern flour milling is a complex process which must be left to the specialists but becomes aware that sheet metal construction provides clean, smooth highways as the wheat

flows through the nine floors of milling operations. Sheet metal is flexible too, for the craftsman of the industry can readily fashion fittings to conform to detailed and individual specifications for each particular need.

Situated on the east bank of the Mississippi river, just north of its confluence with the Missouri, the mill seems to look beyond the western hills on the horizon in anticipation of its neverceasing need for grain. Standing on its roof, there is a consciousness of its ability to consume an important share of the nation's wheat crop and of its intricate system of sheet metal arteries that are essential to the throbbing process in the nine floors below.

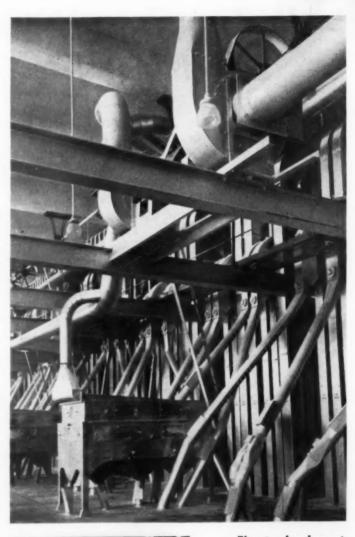
Richardson packer hoppers-fourth floor



J. H. Walters, president of J. H. Walters and Company, Alton, sheet metal contractor, estimates that this project has consumed 400 tons of galvanized sheet steel ranging from 10 to 26 ga., 100 tons of angles and structural shapes, and 35 tons of stainless steel, from 1/4 in. plates to 26 ga. sheets; all of which were fabricated during the period the mill has been under construction. Peak employment totaled 150 sheet metal workers working under the supervision of Clarence Hausafus, shop superintendent, Bruce Lusk, Victor Wille and Wm. Altenberger, foremen. All workers belonged to Local 268, Sheet Metal Workers' International Association.

After one and one-half years of construction the mill was put in operation and it is anticipated that another six months will be needed for final completion. Sheet metal's important role will not end upon completion because continual operation will require maintenance and further exemplifies the reason for the continuous demand by the sheet metal industry on the nation's steel supply as it serves industry.

One of the major problems confronting officials of the Russell Miller Milling Company when they planned the erection of a new flour mill and elevator over the sites of the previous structures which had been destroyed by fire was the vast amount of sheet metal work that was required. In the midst of unprecedented shortages of materials and

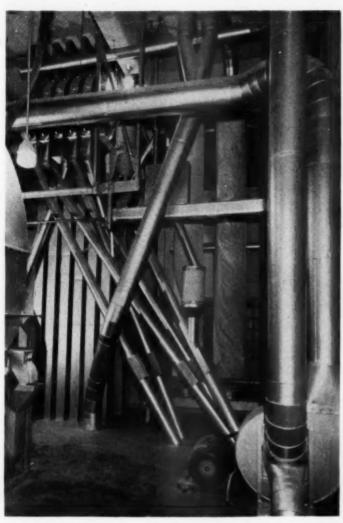


Elevator head spouts

Dus



Sixth floor spouting



Dust pickup section ninth floor

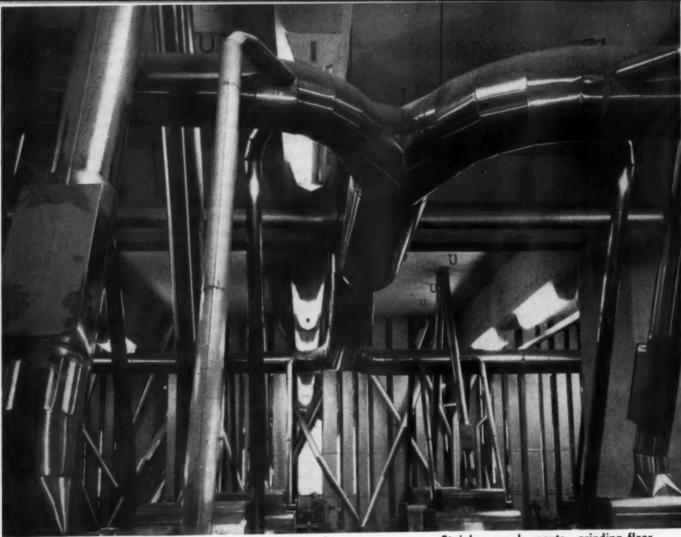
mechanics it was assumed it would be impossible to find a single shop that could fabricate and install a sheet metal project involving approximately 600 tons of sheets, plates, and angle and channel iron without retarding the completion of the mill. However, J. H. Walters and Company had impressed the management with faithful and efficient service for maintenance in the old mill and under these circumstances they turned to Mr. Walters for suggestions. He assured the mill officials his company could arrange to handle the job to their satisfaction. On his assurances, he was authorized to proceed with all the sheet metal work required during the erection of the new mill.

. By the time the debris of the burned mill had been removed and the pile-driving for the new nine story structure had begun, Mr. Walters' organization began to design and submit for approval the various fittings needed for flour milling, such as spouting, elevator boots and heads, two- and three-way valves and splitters, access doors, elevator legging, swinging spouts, and numerous other items. Special elevator boots and heads were designed to allow for free and easy access and to comply with the pure food laws, the boots being round bottomed with two hinged doors for quick release in the event of clogging.

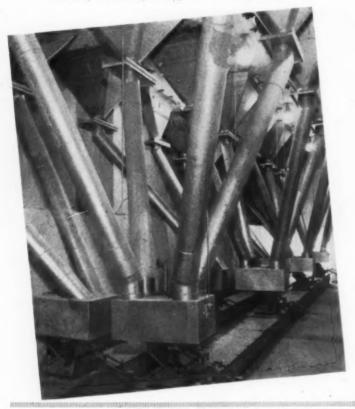
Enormous quantities of 2 in. diameter round stainless steel spouting required not



Sixth floor spouting



Below, wheat spouting under tempering bins



Stainless supply spouts-grinding floor

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only production methods but an improvement in common shop procedure because of the metal's temper and the need for a uniform and accurate product. In this case, the cut sheet with folded edges forming the lock seam was hooked on a movable, heavy metal bed and a grooved mandrel. The mandrel was sized so that as it was turned by a crank, the folded edges overlapped sufficiently to become hooked. During this operation the bed caused a drag which held the sheet tight on the mandrel, resulting in a uniform curvature. The formed and hooked sheet was then removed from the mandrel and its seam flattened in a groover. The uniform and perfect forming of the 2 in. diameter spouting by this method is evident in the photographs.

The manufacture of conveyor trough presented an interesting phase of work, over 5,000 feet in four different sizes was needed. As no regular sheet metal machinery could readily form this U-shaped item, special machines were built by shop mechanics which quickly and uniformly produced a perfectly shaped trough of 12 and 14 ga. sheet steel.

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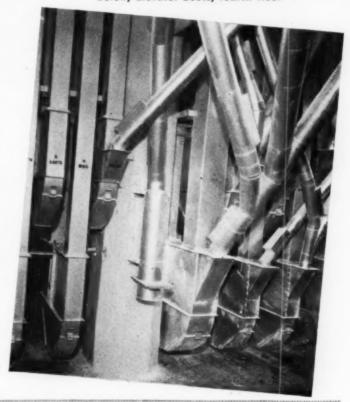


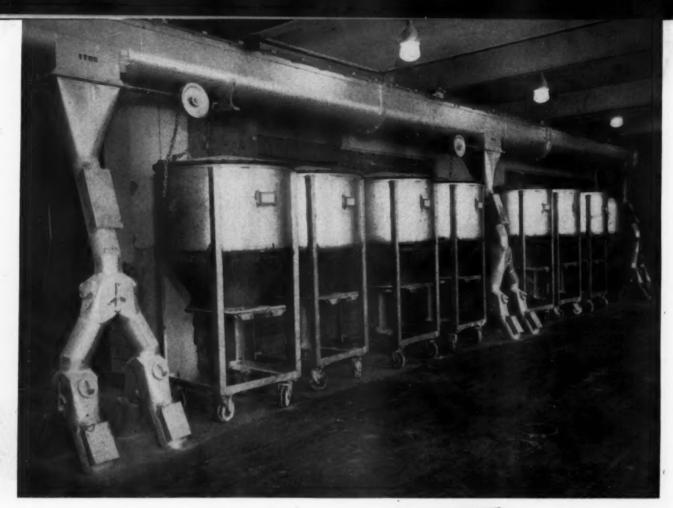
Suction system-grinding floor

During this time of getting ready, Mr. Walters was searching for a new shop and placing orders for new machinery because he realized his shop facilities had to be increased many times to cope with these new demands. And not the least of his troubles was finding material. A large garage building with lot space adjoining for a Quonset hut, which was built for material storage, was purchased. By the time this location was available the machinery and materials began to arrive. New machinery included a 10 ga. power shear, rolls, nibbler, lock formers, punch press, arc and spot welding equipment, additional brakes, and shears, all of which Mr. Walters arranged, with machinery from his previous shop, for efficient production.

Over 20,000 ft of flour spouting was made with thousands of angles, elbows, and access doors. The segments for angles were cut with a special die on the punch press which was utilized for many cost saving operations, such as forming handles and notching. Spot welding fittings saved a prodigious amount of time.

Below, Elevator boots, fourth floor





Cake mix hoppers and conveyors



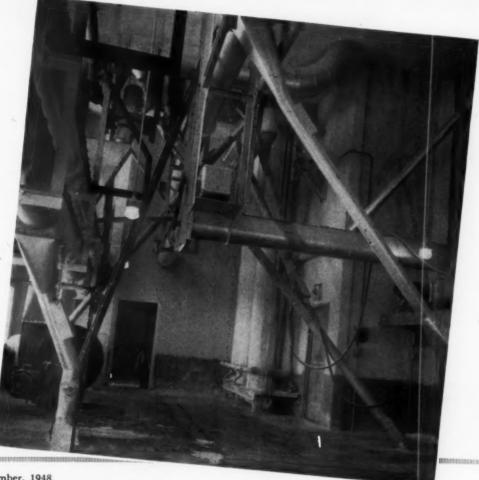
Whole wheat packer hopper and elevator

AMERICAN ARTISAN, September, 1948 SHEET METAL SECTION

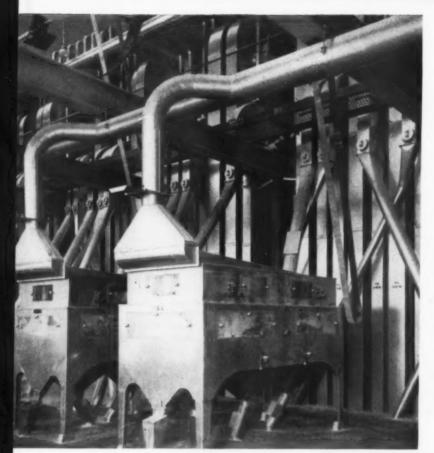


Cake mix hoppers seventh floor

Seventh floor conveyors and spouting



American Artisan, September, 1948 SHEET METAL SECTION



The supply spouting and suction piping on the grinding floor were made of 26 ga. stainless steel. To the eyes of both the mill officials and the sheet metal workers, this was the most beautiful floor in the mill. As most sheet metal men know, stainless steel requires a technique gained only from experience and the ingenuity of the shop mechanics is readily noticed here because they produced a machine that rolled the piping perfectly round without flattening immediately adjacent to the seams.

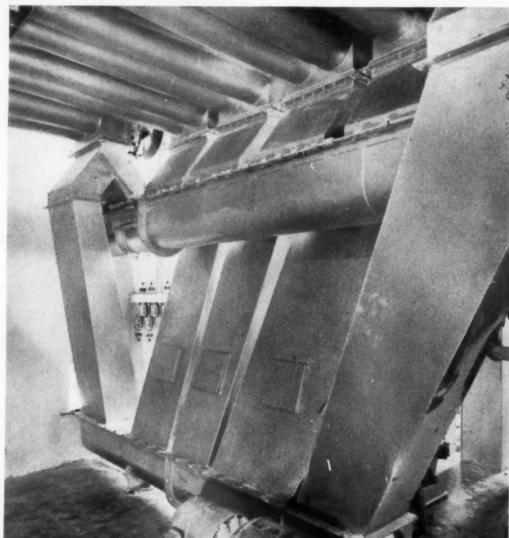
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In addition to all sheet metal work required for the manufacture of flour, an air conditioning system to serve eight floors of the mill, consisting of seven separate housings and tons of ductwork, was installed. This part of the work together with the dust collecting systems of the mill and elevator, although major items, was dwarfed by

Elevator head spouts and suction system



Blending house valves and hoppers

the total sheet metal work required for the milling process.

The skill and patience of the supervisory personnel in laying out the work and managing fabrication and installation proved that there are still mechanics who are ready to accept responsibility and who take pride in their trade. Such case is rather rare now.

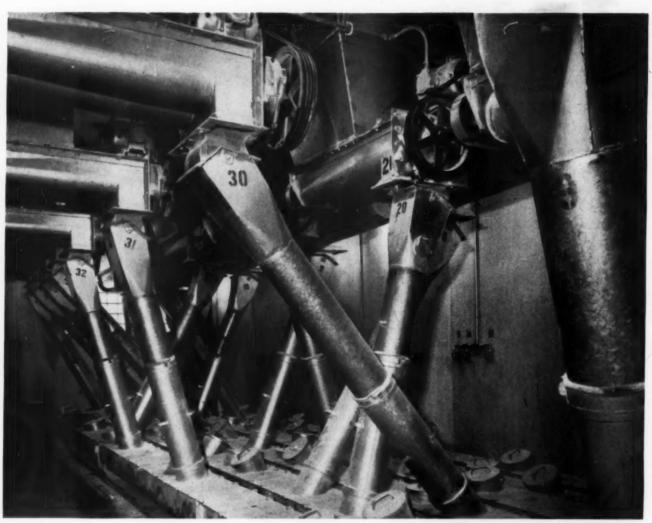
After the wheat is delivered by truck or rail to the elevator where it is weighed, graded, cleaned, and stored, it is carried to the mill basement by belt conveyors where it is elevated to the ninth floor. As the wheat is reduced from grain to flour it passes through a circuitous route of sheet metal work which conveys the material from floor to floor to the machines for each step in the milling process. Its passage from the ninth to the fourth floor several times accounts for the labyrinth of sheet



Cake mix hoppers and tanks



Cake mix elevators and hoppers





Swinging spouts under feeders—first floor blending

the mode it of

Automatic packing machine—cake mix

metal work in the process.

During this time the flour is passing from one side of the mill to the other. As the ground wheat berry moves from the cleaning side to the blending side, it passes through rolls which become finer and finer until the last grinding which is done by rolls that are almost perfectly smooth. The bran and impurities are removed by the time the berry is broken the second time and from there on it is a process of breaking down the particles of wheat into flour. It is then conveyed to blending tanks and from there to the hoppers over the packaging machines where it is put in paper and cloth bags.

It might be added that while Mr. Walters was directing the operations at the Russell Miller Milling Company mill, his shop was taking care of its regular run of business which included the fabrication and installation of sheet metal work in an Alton paper mill.

AMERICAN ARTISAN, September, 1948 SHEET METAL SECTION

In Foundries-

Sheet Metal Boosts Production, Aids Health

R. C. NASON Long Island City, N. Y.

A N APPLICATION of sheet metal work handled by the contractor in our industry that has an important effect on both production and worker's health is the dust collection system in the foundry. Without the modern ventilating and dust collecting system, that is designed and installed by the sheet metal contractor, it would not be possible to maintain present-day levels of production nor prevent the infection of foundry workers by the dust produced in the casting process.

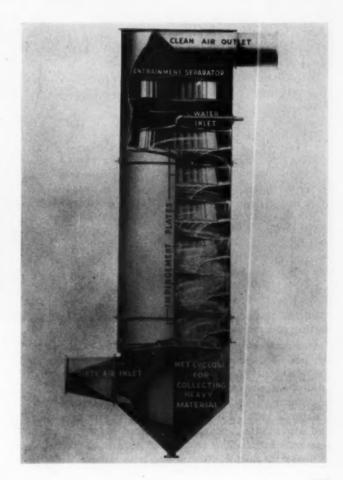
The Guilty Micron

One of the most difficult things to handle, in the making of iron castings, is the micron or super-fine particle of dust. Unless these particles are trapped and exhausted at their source they tend to interfere with satisfactory casting and make the air dangerous to breathe. The G. B. Taylor Co., a foundry in Brooklyn, N. Y., has met this problem by the installation of a dust removal system designed by Industrial Products Engineering Corp. and Wm. H. Peepels Co., a sheet metal contractor. Both firms are located in Long Island City, N. Y.

The Casting Process

As an introduction to the actual problem posed in removing the dust from a foundry in operation it would be well to trace the path of a casting. The first step is the formation of the flask or core box, which is formed around the pattern to be cast. After the flask has been filled with molten metal it is taken to the shakeout. This mechanically agitated bed breaks the sand loose from the casting and the sand passes through the

Fig. 1. The illustration is a Schneible wet method collector like the one used in the foundry described in this article. Dirty air enters the collector through a duct just above the cone at the bottom. The cleaning liquid (water) is introduced just below the entrainment separator in the upper tower. Collected dust particles are removed in a wet condition through the bottom cone. There are no moving parts within the tower.



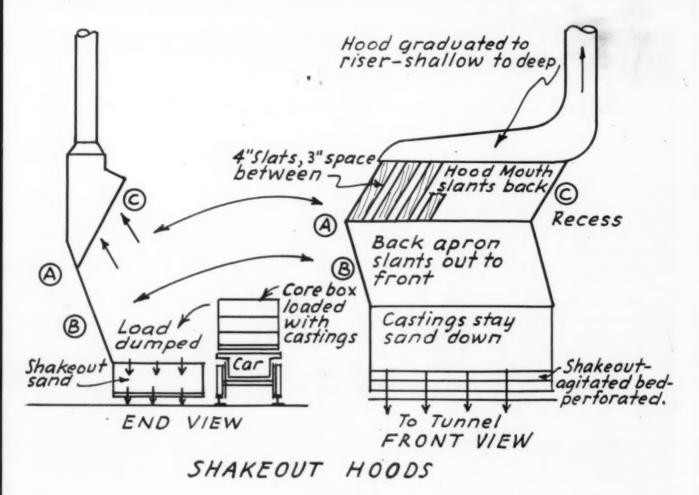


Fig. 2

openings in the bed into a tunnel below.

It is precisely at this point in the process that ventilation is required since a great deal of steam and fine dust is produced by the shakeout.

Molding Sand Re-Used

The molding sand is to be used again so it is conveyed to a refining apparatus after it drops through the bed of the shakeout. First step in refining the sand is the removal of all bits of waste metal by means of a magnet. Beneath the magnet is a breaker screen that removes lumps from the sand before it is passed on to a bucket conveyor that dumps it into a cooling aerator. Next it goes to a centrifugal muller, or mixer, where water, binder (petroleum base) makeup sand and other ingredients are added. When ready for use it is delivered to supply hoppers for molding machines (tampers). It then is formed into flasks again and the casting process is repeated.

As indicated above, the place in the process at which the need for exhaust ventilation is the greatest is at the shakeout. Since the sand that is broken from around the casting is very dry, containing less than 7 per cent moisture, it tends to produce an excess of dust that is harmful to the lungs of those who breathe it and also microns, previously referred-to, which interfere with satisfactory casting. The most effective way to deal with dust of this nature is to remove it at the

very source and that is the way the installation we are describing was set up.

The hood design used at the shakeout is shown in the drawing (Fig. 2) and the photo (Fig. 3). The work area needed for dumping the core boxes was large and if hoods directly overhead had been used they would have interfered with this area. As a result, the hoods were tilted to enable them to get close enough to the dust source to be effective. Steel slats 4 in. wide with a 3 in. space between them were bolted across the face of the hood, which was about 36 sq ft in area.

The top of the hood is graduated in depth, starting out shallow and increasing in depth as it approaches the riser. This is a consequence of the riser being placed at one side of the hood and not at the center and this in turn was planned to bring the risers near the wall where the main overhead duct was located.

Duct Dimensions

Ducts from $8\frac{1}{2}$ to 18 in. diameter were made of 18 ga steel; $18\frac{1}{2}$ to 30 in. diameter, 16 ga and all diameters above 30 in. were made with 14 ga metal. All elbows were specified as two gauges heavier than the piping they connected and of seven piece design.

Straight ducts were made up in the Peepels shop in 4 ft sections and four of these sections were then welded together. When erected the long sections were joined by angle rings welded to the duct ends. Branch

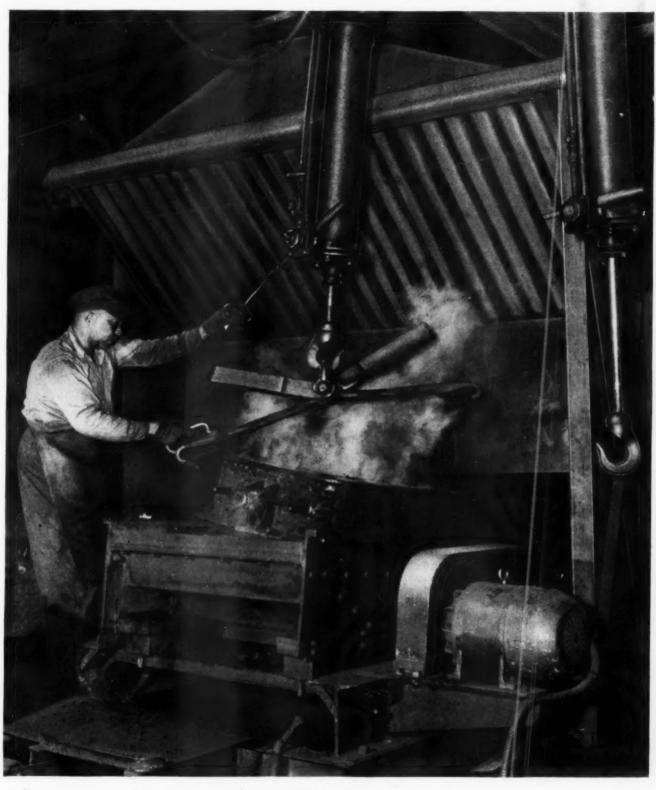


Fig. 3. Close-up of Shakeout and Hood.

ducts joined the mains by side connections at a 45 deg angle. The angle rings mentioned were welded into place on location and the usual size was 2 by 2 by 3/16 in. The main duct is 43 in. in diameter when it meets the collector and the duct connected to the fan outlet is also the same diameter.

The heart of this collection system is a Schneible

Multi-Wash wet method dust collector (Fig. 1), which is rated at a capacity of 30,000 cfm. Actually, in this installation the collector is overloaded 10 per cent, in order to increase the air velocity and thus raise the pressure all along the line. The pressure is calculated at 8 in. static and the velocity in the main duct is about 4,000 fpm. A 58 hp motor is required for the fan.

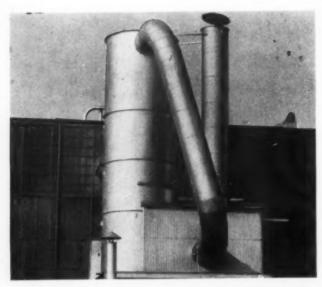


Fig. 4. This photo shows how the Schneible collector appears on the outside. As indicated previously, the dust-laden air enters the bottom and passes upward through the cleaning liquid. It leaves the collector through the angling, vertical duct shown and goes to the discharge fan below.

Air volume handled at the various points in the system is indicative of their importance in the installation. At the shakeouts, 7,000 cfm; tunnel exhaust, 1,250 cfm; shakeout transfer chute, 1,000 cfm; transfer belt, 750 cfm; magnetic pulley, 1,250 cfm; elevator boot, 750 cfm; elevator top, 750 cfm; breaker screen, 3,000 cfm; aerator, 1,300 cfm and muller, 2,500 cfm. The air velocities in the duct system increase as the collector is approached. Starting with 300 fpm at the hood at the shakeouts, the speed is stepped up until it reaches 4,000 fpm where the main joins the collector.

There were three main points in the design of this system: first, an overloaded collector produces the required pressure; second, adequate air volume and velocity is supplied at all sources of dust; third, microns are captured at their source and so do not interfere with the quality of the molding sand. As installed, the system is effective enough that the shakeout process can be carried out on all shifts with no resultant harm to the casting process.

The sludge, material which has gone through the wet collector and been discarded, is trucked away from the plant daily. Enough of the molding sand goes into this sludge that it becomes necessary to add sand during the reconstituting steps.

Other Sheet Metal Work

While this article has been restricted to one phase of dust collection, there are other uses of exhaust systems as there must be in every foundry. Power grinders, which clean castings, generate quantities of dust that must be removed, as do the molding machines. And the molding machine room is ventilated by roof exhaust fans, another installation handled by the sheet metal contractor.

Almost any step in the production process in a foundry calls for adequate dust collecting and exhaust equipment and the sheet metal contractor plays a vital part in making a foundry livable. Many other industries depend on the sheet metal contractor for his products and services.

JURISDICTIONAL AWARDS

Joint Board No. 3

Dispute between the United Association of Journeymen and Apprentices of the Plumbing and Pipe Fitting industry of the United States and Canada and the Sheet Metal Workers' International Association.

The issue in dispute is the installation of copper piping in breweries for beer lines, wort lines, yeast lines, CO_z lines, and refrigeration in connection with attemperator tanks.

After carefully considering all of the evidence and argument as presented by both sides, the Joint Board decides as follows:

The installation of streamlined or other manufactured copper pipe or fittings for beer lines, wort lines, yeast lines, CO₂ lines is the work of the United Association of Journeymen and Apprentices of the Plumbing and Pipe Fitting Industry of the United States and Canada. The installation of copper attemperator coils in the interior of tanks and vats in breweries is the work of the Coppersmiths, members of the Sheet Metal Workers' International Association.

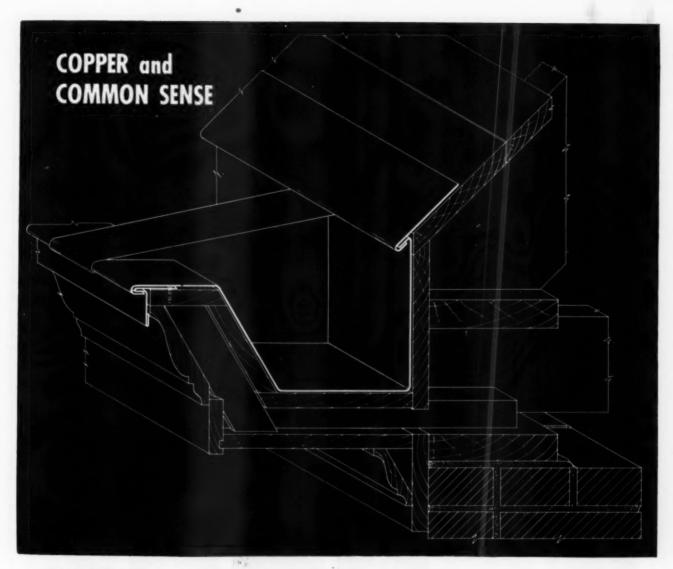
Joint Board No. 15

Dispute between the Sheet Metal Workers' International Association and the International Association of Bridge, Structural and Ornamental Iron Workers.

The issue in dispute is that involved in cases 15 and 22. The Joint Board may consider the whole issue of the installation of steel decking in accordance with the agreement between the two unions.

After carefully considering all of the evidence and argument as presented by both sides, and two intervening organizations, the Joint Board decides:

The installation of steel decking for roofing, if ten gauge or lighter, is the work of the Sheet Metal Workers' International Association. The installation of steel decking for flooring is the work of the International Association of Bridge, Structural and Ornamental Iron Workers. This decision cannot alter previous decisions of record.



QUESTION: What is the best way to determine locations of expansion joints in sheet copper construction?

ANSWER: Use the chart on page 28 in "Copper and Common Sense"

ACHART which makes it easy for you to determine the correct gauge copper for any gutter lining as well as the maximum distance that may safely be used between an expansion joint and a fixed point is one of the important results of Revere's extensive sheet copper research program. This chart and simple instructions for using it are on pages 28-29 in Revere's 96-page book, "Copper and Common Sense."

This booklet is filled with new facts which enable you to design or install gutter linings, flashings and roofs that give extra years of service. It is complete with charts, illustrations and detailed information so arranged that you can read and apply final figures that insure the finest sheet copper construction.

This book has been widely distributed to architects and sheet metal contractors, and in all probability it is in your office files. Be sure to refer to it. If you do not have a copy, write for one now on your office letterhead.

For further information or assistance with the design or installation of sheet copper, the Revere Technical Advisory Service, Architectural, will be glad to help you.

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Boller Brushes No. 8-399—2"x4"x6" No. 8-400—2½"x4½"x6" No. 8-401—3"x5"x6"



Single and Double Spiral Five Brushes

No. 8-433—Single Spiral
—1" to 4" dia.
No. S-433—Double Spiral
—1" to 4" dia.
No. 8-434—For small
Flues, ½" to
1" dia.



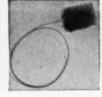
SCHAEFER Round Flue Brushes of Single Spiral, Flat Steel Wire No. 8-430-1" to 4" dia.



SCHAEFER Rectangular Flue Brushes of Flat Steel Wire—Spiral No. 8-420-2"x3\"x4" No. 8-425-2\"x6\"x7"



SCHAEFER Furnace Brushes of Silver Brite Rustproof Steel No. S-442-3", 4", 4½", 5" with 5 ft. handle.



SCHAEFER Fibre Furnace Brushes Fibre Furnace Brushes Selected Bassine fibre, flexible wire stem, 4", 5" 6" dia., 48" and 60" handle.

No. S-444-445



SCHAEFER Chimney Cleaning Brushes No. 68-6". 7" 8" 10" and 12" dia. round style of Black Tempered Brush Wire. No. 888-6", 7" 8", 10" and 12" dia. obiong style of Flat Tempered Steel Wire.



SCHAEFER
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Solid Center Type of
crimped steel wire.
No. 276-6" dis. x 1%"
face.

face. No. 278—8" dia. x 1%" No. 280—10" dia. x 2"



SCHAEFER Handy Wire Brush No. 816 — For roughing, soldering, etc., 6" long, tempered steel wire trimmed 114".



Tin Handle Acid or Dope Brushes

Selected grade brisles in tin ferrule. Width, %".

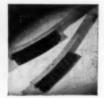


T. W. Flat Acid Brushes Tinners soldering brush, horsehair filling, 14" width, 74" overail. Twisted wire handle.



Radiator or Condenser Tube Brushes

Twisted in wire handle, selected hair or bristle. Wide range of sizes. No. 10—% dia. x 2 brush x 64% overall. No. 11—4% dia. x 3 brush x 85% overall.



SCHAEFER Curved Handle Wire Brushes

No. 810 — Oil tempered steel wire, trimmed 1¼", hardwood block, 14" long. Brush 6", 2, 3 or 4 rows.

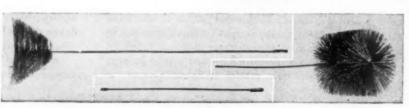


SCHAEFER Shoe Handle Wire Brushes No. 812 — Oil tempered rustproof wire, 5" brush, 2, 3, 4 rows, Trim 1½", overall 10". rustproof wir 2, 3, 4 rows, overall 10".



SCHAEFER Straight Back Wire Brushes

No. 800-11—Oil tempered steel wire. Hardwood block, 71/4" x 21/4". Wire trim, 11/4", 6 x 10 rows.



SCHAEFER Vacuum Cleaner Brushes
No. 1005—Bassine Fibre Brush, 10½" dia. tapered
to 3" dia. x 6 ft. long—48" handle with
threaded nipple at end.
No. 1000—Bassine Fibre Brush, 10½" dia. brush x
10" long. Handle 38" with threaded nipple at end.

Wire Flue Brush and Extension Handles

4 ft. Handles with Nipple and Coupling.

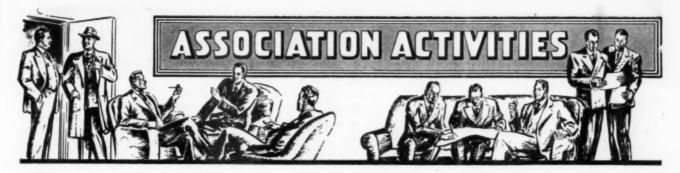
5 ft. Handles with Nipple and Coupling.

6 ft. Handles with Nipple and Coupling.

Write for SCHAEFER Catalog of flue and furnace brushes, or for information on any special brushes for specific requirements.

SCHAEFER BRUSH MFG. CO.

1025 South Second Street Milwaukee 4, Wisconsin



Canada

All of the test plans which were mailed to the Chapter office following the schools have been marked. Those students who submitted test plans will very shortly receive a report as to the grades received for the two questionnaires and the two test plans. Students who receive at least 80 per cent on all four tests will be mailed an association certificate. Those who receive less than a passing grade will have the option of completing additional work in order that they may qualify for an association certificate.

Many recommendations relative to the 1949 school program were drafted when the Technical Advisory Committee met in Toronto. These were presented to the Board of Directors for consideration. A complete report on the board's decision will be released in the future.

The Board of Directors recently approved applications for manufacturer memberships from:

Chatco Steel Products, Ltd., Tilbury, Ontario, manufacturers of warm air furnaces.

Machineries Pont Rouge, Ltd., Pont Rouge, P. Q., manufacturers of warm air furnaces.

C. B. TAYLOR

Managing Director.

Indiana

H. W. Meggs, president of our association, was recently appointed to membership on the Building Code Committee of the Chamber of Commerce, New Castle. The City Council expects an early first reading of an ordinance creating the office of Building Inspector and is reported to be in favor of enacting a new building code which conforms to the State Building Code.

FRANK E. ANDERSON

Secretary.

Dayton, Ohio

M EMBERS of the Sheet Metal, Furnace & Roofing Contractors Association, Inc., of Dayton, Ohio, the allied sheet metal industries salesmen, and their families enjoyed the annual family picnic on Saturday afternoon and evening, August 14, 1948, at McCribb's Beechwood Grove. Attendance was over two hundred.

A baseball game between the masters and the salesmen was staged at four o'clock. There was trap shooting, horseshoe pitching, and sports for the kiddies.

A number of door prizes—electric fans, flashlights, door chimes, etc.—were won by those holding lucky numbers.

During the dinner, the shocking news came of the

death of Frank J. Hoersting, president of Hoersting & Holtman Company of Dayton. The crowd paused in silence for one-half minute.

A. J. HOKE

Secretary.

Old Timers Play Golf

THE Midwest and Chicago regions of the Old Timers' Club of the oil burner industry had a golf outing on August 6, at the Biltmore Country Club, Barrington, Illinois. More than 60 members and guests attended from Chicago, Milwaukee, Racine, and other points in the district. Charles Bendix was chairman of arrangements and Howard Maccubbin was in charge of prizes. The Old Timers' Cup was won by James W. Owen, national chairman of the club, and the William Kemp Memorial Cup was awarded to Clarence Pullum.

COMING EVENTS

Oct. 4-8—American Gas Association 1948 Convention, Atlantic City, N. J. Technical Section, Ambassador Hotel; Residential Gas, Industrial and Commercial Section, Ritz-Carlton Hotel; Accounting Section, Haddon Hall. Major T. J. Strickler, Chairman, Convention Committee, c/o The Gas Service Company, Kansas City, Mo.

Oct. 8-10—First Eastern Refrigeration and Air Conditioning Educational Exhibit and Conference. Hotel Bradford, Boston, Mass. Refrigeration Equipment Manufacturers Association jointly with Refrigeration Service Engineers Society. R. Kennedy Hanson, 1017 Clark Building, Pittsburgh, Penn.

Oct. 13-16—National Association of Housing Officials. 1313 E. 60th St., Chicago 37. 15th Annual and 3rd Exhibit. Olympic Hotel, Seattle.

Dec. 5-8—The American Society of Refrigerating Engineers. 44th Annual. Hotel Statler, Washington, D. C. C. F. Holske, President, 40 W. 40th St., New York 18.

Dec. 9-10—National Warm Air Heating and Air Conditioning Association 35th Annual Convention. Hotel Cleveland, Cleveland, Ohio. Committees and Board of Directors meet December 7 and 8. George Boeddener, Managing Director, 145 Public Square, Cleveland 14, Ohio.

Feb. 3-4—31st Annual Convention Sheet Metal and Warm Air Heating Contractors' Association of Indiana, Inc. Write Homer Selch, 944 Hosbrook St., Indianapolis 3.

EQUIPMENT DEVELOPMENTS

Acid Core Solder187

A heavy, cream-like flux that will not run at normal temperatures is now being used in Divco acid core solder. Divco semi-solid flux does not take on moisture from the air. When heat is applied, it flows freely, spreads and penetrates quickly, producing effective fluxing action.



It works well with all solderable metals, including stainless steel, inconel, nickel, and other hard to solder metals.

Division Lead Co., Dept. 119, 836 W. Kinzie St., Chicago 22, Ill.

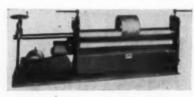
Bending Rolls188

Series 650 Pyramid type bending rolls are all steel construction and feature high clearance between top and lower rolls to permit the rolling of heavy bars and light structural shapes, as well as sheets.

The two lower rolls are spaced closely to minimize the flat spot often found on sheets and plates. All main rolls are forged steel, the Use Coupon on this page

top roll is $7\frac{1}{2}$ in. diameter, and the lower rolls, $6\frac{1}{2}$ in.

Standard equipment includes bronze bearings, silent worm gear



drive, top roll indicators, electric reversing control for direct motor drive, anti-torque frame, and rachet wrench adjustment of the top roll.

A 5 hp motor operates the rolls at approximately 18 fpm.

Reed Engineering Co., 1003 W. Fairview Ave., Carthage, Mo.

Velocity Indicator 189

A Kata thermometer kit for convenient accurate measurement of air velocities between 10 and 600 fpm. The kit, in pocket case, con-



sists of a Princo Kata thermometer, test thermometer, and reference chart.

The action of the moving air on the sensitive bulb constitutes the principle of the instrument. cor per in Ty

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Precision Thermometer & Instrument Co., 1502 Brandywine St., Philadelphia 30, Penn.

A portable timer for shutting off fans after any pre-selected time is known as the Portable AF.

The timer cord is plugged into any convenient outlet and the fan



cord is plugged into the receptacle at the bottom of the timer case. Key hole slots are provided for mounting and rubber pads prevent marring of wall, window, or furniture surfaces if the timer is operated on its back.

Rated at 10 amps, 1/3 hp, 115 v, a-c.

Paragon Electric Co., 1608 12th St., Two Rivers, Wis.

Fan and Limit Controls . . 191

Liquid expansion warm air fan and limit controls featuring a selfcompensated diaphragm are being introduced.



The patented self-compensating diaphragm nullifies the effect of

MAIL THIS NOW!

We will ask the manufacturers to send full particulars about the products and literature mentioned. **Equipment Developments** 190 192 187 188 180 191 193 194 195 196 197 198 200 202 199 204 208 211 212 207 209 Naw Literature 319 320 322 323 324 325 328 330 332 333 Jobber Manufacturer Dealer Name Company Address: AMERICAN ARTISAN, 6 North Michigan Ave.,

Chicago 2, Illinois

ambient temperature and thus the control responds only to the temperature surrounding the element in the furnace.

Three models are available, the Type 518 safety limit control, the Type 519 fan control, and the Type 520 combination fan and limit control

Penn Electric Switch Co., Goshen, Ind.

Baseboard Saw192

Tri-Saw is an attachment for an electric drill and will cut wood, sheet metal, transite, and formica.

It is light in weight and makes fast and accurate cuts into baseboards and walls for registers. Also



cuts plates and subflooring for installing ductwork.

Tri-Saw is equipped with special blades that cut through nails and metal lath without injury to its teeth. Sheet metal up to 10 ga, old vent stacks, and existing ductwork may be cut accurately for remodeling work.

Cuts as small as 1 in. square may be made without drilling a starting hole.

R C S Tool Sales Corp., P.O. Box 1434, Joliet, Ill.

Automatic Shear193

The Kling automatic shear, flanger, and former, using rotary shears, shears, flanges, and forms sheets



and plates in odd and irregular shapes.

Once the sheet or plate has been

placed in position, the operation is guided automatically and pencilpoint precision assures uniformity in the finished product.

Kling Bros. Engineering Works, 1320 N. Kostner Ave., Chicago 51,

Corrugated Aluminum 194

Corrugated aluminum sheets for roofing and siding that weigh 56 lbs per 100 sq ft. Corrugations are



 $\frac{7}{8}$ in. deep and several sizes are available.

A table showing safe loads in lbs per sq ft for various spans is available.

Siding sheets are 33% in. wide

and from 5 to 12 ft in length, in multiples of 1 ft.

Roofing sheets are 35 in. wide and 5 to 12 ft in length.

Reynolds Metals Co., 2500 S. Third St., Louisville 1, Ky.

Recirculating Pump 196

The Oasis recirculating pump and kit has been designed for both large and small evaporative coolers

Patented shallow pan baffles enable it to give efficient pumping action in sumps as shallow as 1½ in.

The kit contains an Oasis pump, float valve, rubber hose, overflow pipe, complete specifications, and instruction details.



The kits are readily and easily merchandised and enable installations to be made in any evaporative cooler in a few minutes.

Palmer Mfg. Co., Dept. OP 1485, 705 W. Jefferson St., Phoenix, Ariz.



Duct Insulation195

Two Fiberglas materials for insulation of ducts are announced.

Fiberglas coated duct insulation, for heating and cooling ducts, is a lightweight material in board form, with a coating on both sides. It can be cut with a knife to conform to irregular shapes and curved surfaces, and can be scored to take a gradual or sharp bend. The coated surfaces can be painted, or covered with asbestos paper or canvas.

Thermal conductivity is approximately .26 at 75 F mean temperature, and density, 6 lbs per cu ft.

Fiberglas flexible duct insulation is an uncoated, extremely light-weight material designed primarily for application on concealed heating and cooling ducts where finish is not required. Two densities and weights are available: .5 lbs per cuft, weighing .021 lbs per sq ft; and 1.0 lb per cu ft, weighing .042 lbs per sq ft. Thermal conductivity is .23 to .25 at 75 F mean temperature.

Owens-Corning Fiberglas Corp., 1930 Nicholas Bldg., Toledo 1, Ohio.

EQUIPMENT DEVELOPMENTS

Use Coupon on Page 116

Limit Control 197

Surf-a-stat is the trade-marked name of the Type H-31 high limit control. It is suited for safety control on gas conversion units in warm air furnaces. The switch is



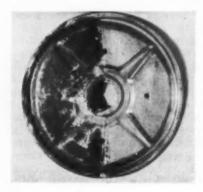
activated by a bi-metal mechanism. Silver contacts are enclosed in an aluminum die-cast housing.

The surface control temperature range is 100 F to 250 F, adjustable by a calibrated dial carrying maximum and minimum stops. Operates on 24 v, 2-wire circuit, with a current rating of .75 to .85 amps.

Crise Mfg. Co., 2040 E. Main St., Columbus 16, Ohio.

Cleaning and Coating 198

Alumatreet is a chemical formula which cleans aluminum and at the same time creates an absorptive



crystal coat. The resulting double action assures a tight paint lock, free from blisters and peeling.

Alumatreet may be used for removing dirt and oxide and restoring aluminum casting or other alloys of aluminum. It gives a ductile nonmetallic coating that does not flake even on light-gauge aluminum.

Farrelloy Company, 1245 N. 26th St., Philadelphia 21.

Redesigned Gas Furnaces . . 199

Production of redesigned Janitrol gas fired winter air conditioning units is underway.

Most noticeable change in the

cabinet front is from the use of two horizontal cabinet ventilating scoops. The convex surfaces inside the recesses direct the ventilating air over all the controls to assure adequate ventilation when the furnace is installed in compact utility rooms.



Each burner ribbon releases as a complete unit by prying it out with a screwdriver. To facilitate cleaning the heat exchanger, the top plate flue collector has been redesigned for easier re-

moval.

A combination of a new type turbulator and heat transfer principle adapts the unit for low air volume operation required for Continuous Air Circulation. It is believed this is the first manufacturer of gas equipment to offer units that are factory adjusted for C A C operation.

There are six sizes of winter air conditioning units in the new line, ranging from 60,000 btu to 180,000 btu.

Surface Combustion Corp., Toledo 1, Ohio.

Room Conditioner200

A new window-type room air conditioner, equipped with two separate refrigerating systems, has been developed.

The dual refrigerating systems, operated by two hermetically-sealed, self-oiling Meter-Miser compressors, provide more than three-fourths of a ton refrigerating capacity. They can be operated together or separately.

The unit is 28¼ in. wide, 32½ in. deep and 14¼ in. high. It filters, dehumidifies, cools and circulates air at the rate of 325 cfm. Fresh outside air can be added at a rate of up to 50 cfm.

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Two controls regulate the conditioner. A four-position master switch controls the fan and cooling systems and an adjustable fresh air control governs the amount of outside air brought into the unit. A thermostat control is available.

Frigidaire Div., General Motors, Dayton 1, Ohio.

Gas Producer201

Safe-Tee-Way gas is produced from liquid pentane, a crude oil by-product. The gas is manufactured as used and burns with a hot, blue flame. The Safe-Tee-Way gas producer is automatic, completely sealed in. It operates when gas is required.

Two moving parts are involved, an air fan motor and fuel pump.



Bearings are sealed in grease. Fuel tank is buried underground. Gas pressure is only 4 to 5 ounces per square inch. If the electric current is interrupted, an automatic, Underwriter approved safety switch operates. To re-start the gas producer, the switch must be turned on by hand.

Safe-Tee-Way, Inc., 1743 Chester Ave., Cleveland 14, Ohio.

Twin Fuel Burner202

The National Automatic burns gas until outside temperature drops to 20 F or less at which time the outside thermostat automatically



changes over to oil. At temperature above 20 F the change to gas is also automatic.

The change over temperature may be varied to conform to local gas company requirements.

National Engineering & Mfg. Co., 523 Wyandotte St., Kansas City, Mo.

Blower-Filter Unit203

The new Viking blower-filter unit, modern in appearance and design, incorporates new mechanical and aerodynamic features. Intended for the mass production market, it is available in two sizes.

The smaller has an 11 in. blower wheel with a capacity of 1,000 cfm, suitable for furnaces up to and including 24 in. The larger, with a 13



in. blower wheel, is rated at 1,800 cfm, suitable for furnaces up to and including 28 in.

Filters are arranged in the cabinet so that upon removing the rear door, cool air may be drawn from the basement through the filters for summer circulation.

Quietness has been stressed both in design and in the mountings.

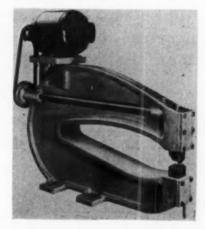
The new unit comes completely assembled ready for installation.

Viking Air Conditioning Corp., 5600 Walworth Ave., Cleveland 2, Ohio.

High Speed Shear 204

Nib Shear is presented for the small shop that cannot afford higher priced tools, yet there are many applications for it in large plants.

It is a sturdy long-life high speed shear that handles 14 ga. mild steel with cutters that are readily ad-



justed for irregular shapes as well as straight cuts.

Shipped complete with 1/3 hp motor and illustrated instructions for operating and for adjusting and grinding cutters.

H-A Mfg. Co., Box 346, York,

Cushion Cradled Burner . . 205

This new oil burner achieves its quiet, vibrant-free operation by means of a special moulding of thick Neoprene rubber which completely separates the two halves of the housing. The top half, including all moving parts, rests on the



Neoprene cushion and is secured to the base with bolts which have thick Neoprene washers. No noise or vibration can be transmitted to the furnace.

In addition, the new burner features a firing head capable of obtaining complete combustion from all types of heating oils, including No. 1, No. 2, No. 3 furnace oils, Pacific Coast diesel, catalytic, or thermal cracked oils.

The new burner is equipped with Century's Dial Air Control which operates like a radio dial. Pin-point combustion air adjustment is obtained with the aid of a calibrated dial which eliminates guesswork adjusting.

Century Engineering Corp., Cedar Rapids, Iowa.

Access Door206

Steel access doors in 33 styles and sizes are in production. These doors are shipped with a prime coat of aluminum paint and are ready to install. They fit flush with the surface in which they are installed, hinges are concealed, the lock is level with the door surface, and may be papered or painted to match the wall surface.

Milcor steel access doors are made in three styles and eleven sizes,



ranging from 8 by 8 in. to 24 by 36 in.; styled (1) with a wing of expanded metal for plastered walls, (2) for plastered walls but without expanded metal, and (3) for masonry, tile, wallboard, etc.

The door is 14 ga. steel and the housing, 16 ga.

Inland Steel Products Co., P.O. Box 393, Milwaukee 1, Wis.

Accordion Insulation 207

Infra insulation is accordion pleated in the carton and expanded for installation. Type 4 has two aluminum foil sheets, spaced 1½ in. apart, forming two inner and two

EQUIPMENT DEVELOPMENTS

Use Coupon on Page 116

outer reflecting surfaces, and triangular spaces which separate the foil. The latter prevents the foil from touching and blocks inner convection currents.

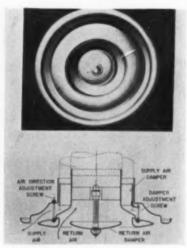
Two flanges are provided along each side for nailing or stapling to study and joists.

Cartons are small, weigh 60 lbs and contain 1,000 sq ft of insulation.

Infra Insulation, Inc., 10 Murray St., New York, N. Y.

Supply-Return Diffuser ... 208

A recent addition to the Kno-Draft line of adjustable air diffusers is intended for use where the air is to be both discharged from and returned or exhausted through a common unit. Supply air is dis-



charged from between the outer and intermediate cones and the return or exhaust air is drawn through the center section of the diffuser. Air is discharged away from the return air opening.

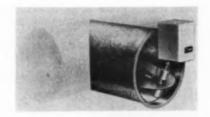
W. B. Connor Engineering Corp., 114 E. 32nd St., New York 16, N. Y.

Draft Control for Oil 209

A Sequence Draft Control for use with domestic oil burning furnaces has been designed as an aid in the conservation of fuel oil. The control consists of a conventional barometric draft control plus a thermostatically activated sequence unit to modify the action of the draft control during periods when the burner is off.

When the room thermostat is sat-

isfied, it shuts off the burner in the usual manner. At the same time, it activates the sequence control which opens the draft control after a lag of about 30 seconds. This gives time for the natural



draft to clear the furnace of smoke, odor, and combustion gases. This opening of the draft control permits the natural chimney draft to continue, but causes it to by-pass the furnace.

When the thermostat calls for heat, the sequence control acts first and returns the draft control to normal operating position. After draft through the furnace is restored, the burner starts.

Sampsel Time Control, Inc., Spring Valley, Ill.

Wall Type Circulator 210

The wall type Warmalator is a fully vented, gas fired warm air circulator rated at 20,000 btu and engineered to fit between 2 x 4 studings on 16 in. centers. The unit



uses natural, manufactured or LP Gas.

Model 20 is 51 in. high and 16 in. wide. It is equipped with a finger type cast iron burner and a shielded, ribbed heating element. A louvered grille covers all heating surfaces. A clicking action control knob for high, medium, or low flame and a thermocouple safety pilot are standard equipment.

Williams Radiator Co., 1821 Flower St., Glendale 1, Calif.



A thermostatically regulated automatic oil burning floor furnace incorporates a motor and blower designed to furnish steady, controlled draft, regardless of adverse draft conditions. This forced draft feature produces a clean, high fire with drafts as low as .02 in.

The unit delivers approximately 52,500 btu. Overall height is 48 in., length 37 in., and width 25 in.

Approved by Underwriters' Laboratories, Inc. and meets U. S. Department of Commerce, Commercial Standard 113 requirements.

J. L. Gillen Co., 204 E. High St., Dowagiac, Mich.

Cutting Tool212

Shearite is a triple-purpose hand tool incorporating a cutter for machine screws, which also cuts and strips electrical wire.

This pocket-size tool cuts off, without damage to threads, any of the four sizes of machine screws most used in electrical work (Nos. 10-32, 8-32, 6-32 and 4-40).

Shearite is made of high-strength alloy steel, hardened for long wear, and is fitted with shock-proof plastic handles.



Shearite tools are available in counter display cartons. Each carton contains six tools individually boxed

Aircraft Marine Products, Inc., 1545 No. 4th St., Harrisburg, Pa.



The Brand most in demand...

Or F course, good steel sheets are still hard to get. But you dealers and metalworkers who have sold and worked with U·S·S Galvanized Steel Sheets are in a better position than many of your competitors. Many of your customers, knowing how much better U·S·S Galvanized Steel Sheets are, would rather wait until you have the stock to take care of their needs properly... than to turn hastily to sheets of unknown quality.

Yes, this insistence on top quality, this loyalty to a dependable product helps you hold your customers during times like these . . . helps you build up a bigger business when materials are plentiful. So keep asking for these easier-to-fabricate, goodlooking, long-lasting sheets. Your supplier will let you have all he can . . . as fast as he can. And may the day soon arrive when you can once again get all you want right when you want them.



U·S·S STEEL SHEETS

CARNEGIE-ILLINOIS STEEL CORPORATION, Pittsburgh and Chicago
COLUMBIA STEEL COMPANY, San Francisco
TENNESSEE COAL, IRON & RAILROAD COMPANY, Birmingham
United States Steel Supply Company, Chicago, Warehouse Distributors

United States Steel Supply Company, Chicago, Warehouse Distributors
United States Steel Export Company, New York
7-1092

UNITED STATES STEEL



Belt drive assemblies with either top or rear mounted motor—with resilient bases to prevent vibration. Direct drive assemblies use specially-designed Peerless Electric capacitor motors—exceptionally efficient and quiet. Blower wheels, directly connected to motor, are forward curved, dynamically and statically balanced.



DIRECT DRIVE Peerless Electric AIRBOY PACKAGE UNIT

Delivers 850 cfm, sufficient for a house of approximately 10,000 cu. ft.; 3-speed motor with motor blower unit rubber cushioned. Blower wheel dynamically and statically balanced; a very compact unit. The two motor bearings are the only bearings in the unit.

Peerless
Peerless
Electric
BLOWER
ASSEMBLIES
in your FURNACES
and CABINETS

ELIMINATE service worries by installing Peerless Electric blowers for winter air conditioning and forced air heating.

Peerless Electric blowers—belt and direct drive types—are designed and engineered from more than 55 years of experience in building quality motors and electrical apparatus. Peerless Electric equipment is complete—manufactured entirely in our own modern plant—not an assembled line—and priced right, offering bigger profits to you.

Write for detailed information.

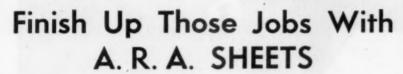
THE Peerless Electric COMPANY

ESTABLISHED 1893

WARREN, OHIO

MANUFACTURERS OF MOTORS FANS AND BLOWERS





Get those summer jobs done and COMPLETELY FINISHED with A.R.A. Sheets. You can't afford to have a dozen jobs half completed—still on your mind but no bills out for collection. Why wait longer for more metal sheets with urgent fall business coming up and winter just around the corner. A.R.A. Sheets are your answer and AVAILABLE NOW.

You bet, they'll do a job—ideal for cold air returns and just the right size for covering 2 joist spaces perfectly. You can roll 'em into rounds on your own rollers or bend 'em into fine rectangular ducts on your brake for "long lines" where the metal saving is great. Special fittings are fabricated every day from these remarkable sheets. Our booklet explains how to do it.

These "tried and proven" easy working one man sheets are actually doing a big job—millions of square feet are used each year. If you have been one of the few heating contractors who hasn't taken advantage of these light weight rigid sheets, start today—call your jobber today.

A.R.A. Sheets are NOW available, take advantage of our favorable position to serve you.

Write for new 16 Page Folder No. 899-A, fully illustrated, showing the many ways you can use A-R-A Sheets.

ACT NOW — BUY A.R.A. SHEETS TODAY AND GUARANTEE YOUR HEATING BUSINESS. GET GENUINE A.R.A. SHEETS FROM YOUR JOBBER.









The one man sheet covers 2 joist spaces perfectly.

A.R.A. Sheets are shipped in easy-to-handle stock cartons. Each carton contains 20 sheets 33" x 48". A carton weighs about 100 lbs.



GRANT WILSON, INC.

141 WEST JACKSON BLVD. AT LA SALLE ST.

Board of Trade Bldg. CHICAGO 4, ILL.

New Engineering Materials for Flexible Duct Connector

Improved duct connector fills long-standing need in heating, piping and air conditioning.

Bauer & Black Field Engineers announce the development of a new economical, long-life, permanent-seal, flexible duct connector.

Elements of the new connector are shown in the diagram. Two unique components make the Bauer & Black Industrial Adhesive Tape unusual and practical.

Fiberglas* Cloth—Thin, super-strong, permanent. Resists heat, light, deterioration. Won't shrink or stretch.

B. Vulcanizable adhesive that grows stronger with age. Sticks with a touch, yet vulcanizes under heat to double its strength!

As a result, the new connector *improves* with age, instead of deteriorating. It is speedily installed, cutting labor costs drastically. The Fiberglas tapes and the neoprene-coated fabric handle easily, conform readily, seal instantly. And the final appearance is crisp and neat, "tailor-made" for an airtight fit.

WRITE FOR DETAILS

Full information on application, source and price will be gladly furnished on request. To see how the new connector can save you time and money, improve your product, address Dept. T 8-9 teday. No obligation.



*Fiberglas (Reg. U. S. Pat. Off. by Owens-Corning Fiberglas Corp.

Products o

(BAUER & BLACK

Division of The Kendall Company . 2500 S. Dearborn St. . Chicago 16

Industrial Adhesive Tape

Production Short Cuts to Reduce Costs . Research to Speed and Improve Methods



At Foley's in Houston:

All ductwork is Kaiser Aluminum

The beautiful new \$12,000,000 Foley's Department Store in Houston has been called the finest device ever built to display and sell merchandise. One of its most important features is a handsome, comfortable-all-year interior made completely

dust-free by ultra-modern air conditioning. Houston's Straus-Frank Company constructed 16 miles of ducts for Foley's air conditioning system, using 200,000 pounds of aluminum in its 6½ floors. And they used *Kaiser* Aluminum exclusively!

Here's why:



Kaiser Aluminum is econom.cal! Pound for pound it gives three times the working surface of steel. What's more, it's far easier to fabricate, is less wearing on shop equipment than other metals, and can't spall.



Wise sheet metal men prefer Kaiser Aluminum to heavier materials. And it can be handled easily with standard sheet metal shop equipment. It's a strong, high-quality material that stands up under rough treatment, too.



Kaiser Aluminum lasts for generations! Can't rust! And it need never be painted! For all these reasons and many more, sheet metal fabricators everywhere are turning to Kaiser Aluminum.

Kaiser Aluminum

product of Permanente Metals Corp.

SOLD BY PERMANENTE PRODUCTS COMPANY, KAISER BUILDING, OAKLAND 12, CALIFORNIA . . . WITH OFFICES IN: Atlanta • Chicago • Cincinnati • Cleveland • Dallas • Detroi. • Houston • Indianapolis • Kansas City • Los Angeles • Milwaukee Minneapolis • New York • Oakland • Philadelphia • Portland, Ore. • Salt Lake City • Seattle • Spokane • St. Louis • Wichita



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OF PRODUCTION

TWO

WORKING DAY

Doing Our Best to Keep Up With

CHAR-

Fabricated ALUMINUM Fittings



Char-Gale aluminum fittings are made to give years of satisfaction to your customers. They are stronger, better looking, longer lasting. They are better for the men who do the job, too. Featherlight, they are easier and cheaper to handle and transport. And what a break their light weight is for the installer!



CHAR-GALE

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SHIFTS

AND NIGHT!

The Needs of the Industry

-GALE

Forced Air and Gravity Registers

Char-Gale registers are designed for the modern house. Their quiet good looks are in harmony with today's architecture and furniture; they are engineered for maximum efficiency. Char-Gale means high quality, yet modern production methods make Char-Gale quality available for the mass market.



Omaha





TO MANUFACTURERS
OF
ORIGINAL EQUIPMENT

in Heating, Ventilating and Air Conditioning

... who build-or are planning to build their own Blower Assemblies, MORRISON offers you:

- Complete engineering service, including templates, shop drawings, tables, data and consultant help.
- 2. Standard equipment wheels of high efficiency—smooth running, lightweight and 3-piece welded construction.
- 3. Wide range of sizes—Double Width, Double Inlet.
- Scroll sides or squares for low cost assemblies in your sheet metal department.

Write for latest Morrison Catalog.



BLOWER WHEELS

Made only for Original Equipment Manufacturers

MORRISON PRODUCTS INC.

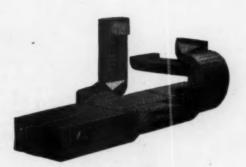
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NOW AVAILABLE FOR PROMPT SHIPMENT

GRAY — "SNAP-RITE" AIR CONDITIONING PIPE AND FITTINGS



No. 160 SERIES ROUND BRANCH LINES



No. 170 SERIES ALL SQUARE LINES

A complete line of Gravity and Forced Air Pipe and Fittings with our positive "SNAP RITE" Lock for quick assembly and erection Wall Stack and Fittings in 31/4" standard depths.

Trunk Pipe and Fittings in 8" standard depths.

GRAY GUTTER FITTINGS

THAT FAVORITE . . . GRAY GUTTER HANGER

GUTTER END CAP



One-piece — Snap Wire Clip Attached. Strong and Ornamental. 4", 5" and 6" — Galv. and Copper.

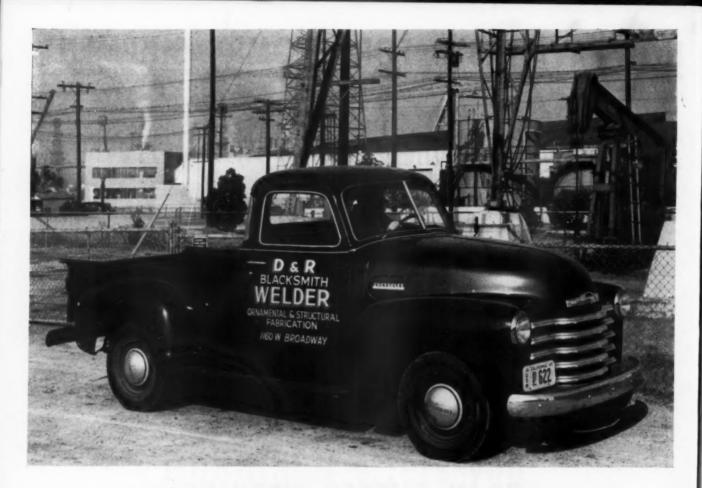


One-Piece — Double Drawn Edges Three Sizes—4", 5" and 6" Galv. and Copper

Samples on Request

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GRAY METAL PRODUCTS, INC. 30 CARLTON STREET ROCHESTER 7, NEW YORK



They "Deliver the Goods" N HIGH STYLE . . . AT LOW COST



CHEVROLET You'll find that Chevrolet Advance-Design trucks offer more of what you want in your trucking operations.

They have the class of advanced styling . . . smart, modern appearance that speaks well for your business wherever they're seen.

And they back up the promise of their looks with advanced engineering that puts them far ahead in rugged durability, economy of performance, driver comfort.

Check over the features of these newer, finer Chevrolet Advance-Design trucks. Check over the costs of ownership. You'll find they're the only trucks that bring you Chevrolet's 3-way thriftthe triple economy of low operating costs, low upkeep costs and the lowest list prices in the volume field! See your Chevrolet dealer-and test the best!

CHEVROLET MOTOR DIVISION, General Motors Corporation, **DETROIT 2, MICHIGAN**

Here Are the Features You Want . . . And Only Chevrolet Advance-Design Trucks for '48 Have Them All!

FLEXI-MOUNTED CAB, cushioned against road shocks, torsion and vibration-New Advance-Design-Gearshift Control and Foot-Operated Parking Brake in models with 3-speed transmissions . . . IMPROVED VALVE-IN-HEAD ENGINE, more durable and efficient . . . 4-SPEED SYNCHRO-MESH TRANSMISSION on Heavy-Duty models for quicker, quieter shifting . . . SPLINED AXLE HUB CONNECTION on Heavy-Duty models provides greater strength and durability . . . OTHER ADVANCE DESIGN FEATURES: The cab that "Breathes"* . . . Uniweld, allsteel cab construction . . . New, heavier springs . . . Hypoid Rear Axles on ¾-ton and heavier models . . . Hydrovac Power Brakes on Heavy-Duty Models . . . Ball-Bearing steering . . . Wide Base Wheels . . . Standard cab-to-axle dimensions . . . Multiple color options.

*Fresh air heating and ventilating system optional at extra cost.

CHOOSE CHEVROLET TRUCKS FOR TRANSPORTATION UNLIMITED

CHEVROLET ADVANCE TRUCKS

V DRAFT FEATU

PRODUCES CONTROLS **CUTS OIL** STEADY, CONSUMPTION ALL DRAFTS CLEAN FIRE

A newforced-draft control feature on the improved Gillen costly service calls involving draft difficulties have been Floor Furnace keeps a flow of air moving into the burner practically eliminated. in a constantly regulated volume . . . regardless of adverse outside draft conditions. The flame burns high, clean and evenly with drafts as low as .02". Oil vapors and air volume maintain an ideal mixture at all times. Oil consumption is greatly reduced.

The Gillen Floor Furnace burns oil with much greater floor level. efficiency than the ordinary type of floor furnace and NO BASEMENT NECESSARY WHEN YOU INSTALL A GILLEN FLOOR FURNACE.

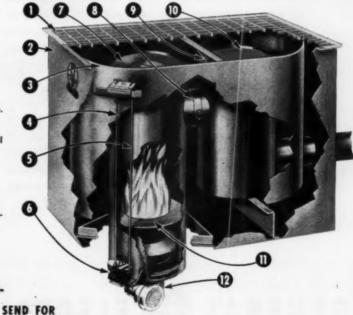
Oil flow is automatically controlled by a room thermostat, and a constant-level oil control valve plus an anti-flooding device assure proper metering of the fuel to the burner.

Installation is accomplished by cutting a centrally located floor opening and suspending the unit from the

N FORCED-DR

OIL BURNING FLOOR FURNACE

- 1. Sturdy floor grille built to take rough treatment.
- 2. Heavy galvanized steel outer casing with a non-corrosive finish.
- 3. Curved liner assures correct cold and warm air circulation.
- 4. Floor level control rod for manual operation if needed. Oil flow is automatically controlled by room thermostat.
- 5. Floor level "on" and "off" rod.
- 6. Constant level oil control valve and anti-flooding device.
- 7. Combustion chamber. Instantly removable for floor servicing.
- 8. Removable band to seal the connection between the combustion chamber and the radiator.
- 9. Safety limit control bulb prevents overheating.
- 10. Large radiator for maximum heating surface.
- 11. Mechanical draft burner assures clean operation, high fire.
- 12. FORCED DRAFT CONTROL PROVIDES CONTROLLED COM-BUSTION UNDER ADVERSE CONDITIONS.



DOWAGIAC, MICHIGAN

Send for information on Gillen's complete line of oil burning water heaters and floor furnaces.



J. L. Gillen Co. 201 E. High Street Dowagiac, Michigan

Rush complete floor furnace data today. No obligation.

Name

Street

A Chain Reaction"

THAT MEANS MORE SALES FOR YOU

YOU will profit from the best advertising in the world... the word-of-mouth praise of a satisfied customer... when you install a General Electric Oil or Gas Furnace. Installations all over the country have proved that the G-E monogram adds up to long-term satisfaction.

SAVE INSTALLATION TIME, TOO

Once ductwork, fuel and power lines are ready, you can book up one of these compact G-E beauties in just about 30 minutes. You get them from the factory completely assembled, tested, ready to install. Compare the cost of installing other type units on the job! See how much time and money you save.

Every time you install a G-E furnace, you're linking your name with a nationally known symbol for reliability, economy and trouble-free operation. Cash in on the consumer acceptance of the "General Electric" name...it will build future sales for you, too. General Electric Company, Air Conditioning Department, Section H8199, Bloomfield, N. J.

GENERAL E ELECTRIC

Automatic Oil and Gas Heat









Paints, enamels, lacquers, varnishes and lithographic inks adhere to Weirzin securely, permanently, because under-film corrosion cannot occur. The tight, malleable zinc coating, electrolytically applied, becomes an integral part of the sheet or strip... remains intact under all conditions of temperature and humid-

ity . . . and provides a perfect "tooth" for spray, dip or roller applications.

Extensive fabrication does not weaken this protection—after deep-drawing, forming and punching, the zinc coating remains unruptured and evenly deposited.

Write today for a sample . . . put it to test . . . then consider how Weirzin would fit into your production picture.

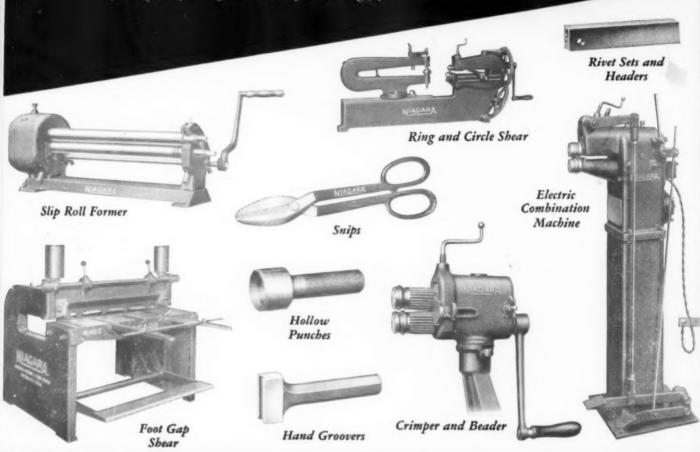


WEIRTON STEEL CO. WEIRTON W. VA., Sales Offices in Principal Cities

Division of NATIONAL STEEL CORPORATION, Executive Offices, Pittsburgh, Pennsylvania

TINNERS TOOLS and MACHINES for SHEET METAL SHOPS

Niagara offers America's most complete line of tinners tools, machines, power presses and shears for production and maintenance. Whether you require hand, foot or power operated equipment, — you get the best when you specify Niagara. Write for catalog 94.



NIAGARA MACHINE AND TOOL WORKS, BUFFALO 11, N.Y. DISTRICT OFFICES: NEW YORK, CLEVELAND, DETROIT







THE CIRCULAIRE

Bryant Model 401 Gas-Fired Radiant Panel Heater

where... pleasing to look at, yet as inconspicuous as my please of furniture that blends well in the room.

Circulaire heats two ways, provides quick, penetrasing head-to-toe cumfort by radiant rays, and the in-

Only 5½ inches thick, Circulaire requires little floor space, fits flush to the walk No catting of floors or floor coverings. Circulaire mounts to the walk with only form

Sell the Circulaire for auxiliary use or year-round service. Three sizes for natural, manufactured, L.P. and other gases, manual or automatic controls. A.G.A. approved.



BRYANT HEATER COMPANY - ELEVELAND, CHIO

circulaire features built-in draft divertes entirely enclosed by the stardy ivory-enamed finish steel cabinet. Flue adapter has provision for round or oval vent pipe.

conceals controls and the quiet, multiple-drilled port cast iron burner. Standard pilots are Bryant Model H for automatic control, 100% shut-off for LP-gases, constant-burning non-thermal for manual control.

MEAT EXCHANGER is separated from well an cabinet from by multiple air spaces, is made of welded steel. "Ruffled" perculain enamed from increases its mediating capacity.













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RECREATION

CONTACE

THERE'S CLARAGE EQUIPMENT FOR EVERY NEED IN EVERY TYPE

Central System
Air Conditioning

Air Cleaning with Air Westlers

Another Place

NOT as much fuel required with Clarage Unitherm Unit Heaters . . . the reason, SYNCROTHERM CONTROL.

Here's a patented device, obtainable ONLY on Clarage Unitherms, which controls temperatures by regulating the amounts of return air passing through and/or around the heating coil.

A constant circulation of heated air is maintained — no stratification; no hot ceilings; no cold floors.

And since uniform, effective heating is accomplished with LOWER temperature air, operating economies are substantial.

If you have any type of industrial heating problem, Clarage Unitherm Unit heaters — and SYNCROTHERM CONTROL — merit your investigation.

CLARAGE

Saves You Money

IS IN

FACTORY HEATING



Unitherms are also built in the SUSPENDED TYPE to save floor space — installed either along the walls or at the ceiling.



CLARCO HEATERS

Unitherm Unit Heaters

also have other highly desirable features. Note V-belt drive insuring quieter operation, wide flexibility of output. Note that outlets are square, permitting 4-way adjustment of heat flow. What you can't see are the positive, centrifugal fans which spread heat evenly over wide areas; that every working

part is easily accessible by removing either front or back of casing.

CLARCO HEATERS are for smaller heating jobs, and to "help out" present equipment. Both Unitherm and Clarco Heaters are available in a wide range of sizes, operating either on steam or hot water.





CLARAGE FAN COMPANY

KALAMAZOO, MICHIGAN . . . SALES APPLICATION OFFICES IN ALL PRINCIPAL CITIES

the COMPLETE Profit LINE



CONCO-BREESE HORIZONTAL OIL BURNERS, Manual and Automatic

CONCO model M-1, M-2, M-3 OIL-FIRED WINTER AIR CONDITIONERS



Every demand for clean, economical, automatic heat is another profit opportunity for CONCO dealers. Their complete CONCO line spans the entire range of domestic heating requirements and includes efficient, dependable heating plants for both gravity and forced warm air, hot water and steam heating systems.



CONCO series 550 BOILER-BURNER UNITS





CONCO-BREESE madel SA-20CB FURNACE-



CONCO model WH-3, WH-5 OIL-FIRED WATER HEATERS









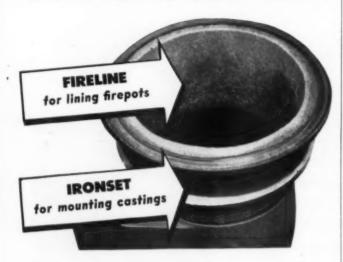






MENDOTA, ILLINOIS

A good combination



You can build business and reputation on the strength of the two materials shown above—FIRELINE Stove & Furnace Lining and IRON-SET Asbestos Furnace Cement.

FIRELINE is a plastic refractory material for lining firepots. It protects and preserves good castings; seals all cracks and holes in burned-out castings—prevents leakage of gas, odors, and dirt through the firepot. After baking out, Fireline withstands 3000 deg. F. Easily installed through the fire door—no new castings; no necessity for dismantling the furnace. Sold in 50 and 100-lb. drums; also in 5 and 10-lb. cans (60 lbs. per case).

IRONSET is highest-quality cement for setting up new furnaces and recementing old ones. You'll never know real cement until you try Ironset. Made by refractory manufacturers, it withstands higher temperatures without cracking or shrinking, bloating or blistering. Order a case of Ironset and try one can. If you don't agree that Ironset is the best furnace cement you have ever used, return the unused portion and get double your money back. Sold in 50 and 100-lb. drums; 5 and 10-lb. cans (60 lbs. per case); and 1-lb. cans (36 lbs. per case).

and FIRE-HEARTH, too!



Here's another good Fireline product. This castable refractory is ideal for setting stokers, for precast combustion chambers, and baffle tile. Just mix with water, pour into place, and trowel smooth. Sold in 50 and 100-lb. bags.

Fireline heating specialties are stocked by leading jobbers everywhere. For better jobs-for better reputation-use these better materials. Write for

literature, prices, and discounts.

FIRELINE

STOVE & FURNACE LINING CO

1816 Kingsbury St., (Dept. I), Chicago 14, III.

NOW AVAILABLE

A complete reprint, under one cover, of Professor S. Konzo's invaluable series of articles —

The

"HOW, WHAT AND WHY"

of the New

Winter Air Conditioning Manual

Everyone who is now using or expects to use the new "Code and Manual for the Design and Installation of Warm Air Winter Air Conditioning Systems" will find Professor Konzo's series a source of much practical help in understanding the Code and correctly applying it to actual jobs. In this great series, Professor Konzo not only explains step by step exactly how to use the Code, but, in addition, tells in detail of the research and experience that is behind each step in the suggested procedures.

Price - Only \$1.00 per copy

AMERICAN ARTISAN

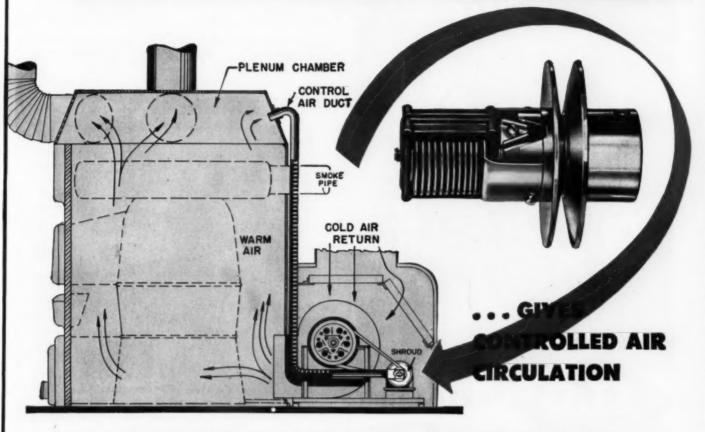
6 NORTH MICHIGAN AVE.

CHICAGO 2 ILLINOIS

.....

Thermodrive opens a new market!

SAVES FUEL ... GIVES GREATER COMFORT ... ELIMINATES DRAFTS AND COLD FLOORS



Thermodrive regulates the flow of warm air in oil, gas or coal forced warm air heating plants

Here's an all-season profitable sales builder that is also an "opener" for other furnace repair business. It is a new fuel-saving item that gets ready acceptance and secures new customers for you.

Thermodrive regulates the flow of warm air heat ... eliminates drafts and cold air pockets. It can be installed the year around. Winter installations require only a two-hour shutdown.

Here's How It Works

Thermodrive automatically adjusts blower speed in accordance with bonnet temperature. A warm air

sample is continuously drawn from the bonnet, and discharged over a thermostatic bellows. This in turn controls the effective diameter of the blower motor pulley, increasing or decreasing fan speed as the bonnet temperature varies. Since the fan turns slowly at the start of a cycle, it can be set to turn on and off at comparatively low temperatures, thus giving efficient circulation over longer periods of time, at lower average speed, in line with the most modern principles of heating practice.

Write for complete details

WEBSTER

WEISTER

ELECTRIC

"Where Quality is a Responsibility and Fair Dealing an Obligation"



NEW LITERATURE

Use Coupon on Page 116

A specification sheet listing features and construction data of the new Model 70 winter air conditioning unit has been released.

Model 70 is a packaged unit, completely assembled and wired at the factory to reduce installation labor to a minimum, styled and engineered for efficiency and appearance. Equipped with a cradle-mounted oil burner and pulsation eliminator.

This unit features a high temperature, stainless steel combustion chamber for quick, peak operating efficiency.

Oil input: up to .65 gph; rating: 70,000 btu at bonnet. Williams Oil-O-Matic Division, Eureka Williams Corp., Bloomington, Ill.

Literature is available describing the Age LP-Gas soldering torches. Each type is fired by the vaporized gas from a cylinder of liquefied petroleum. Gas pressure is easily regulated by a needle control valve. The equipment is portable and may be used either in the shop or on the job. There is no waiting, pumping, soot, or fuel waste.

No. 75-S is a set that consists of soldering coppers, fittings, and a tank which provides approximately 75 hours of continuous burning.

No. 77 is for direct flame soldering and light brazing and has several interchangeable heads for flames from 4 in. to 8 in. long and for a needle point flame 4 in. long. This torch is especially suited for sheet metal work and kindred applications.

All-Gas Equipment Co., 3878 N. Green Bay Ave., Milwaukee 6. Wis.

Four sheet metal worker's tools in a handy carrying case are illustrated.

A standard model cutter which operates in a standard $\frac{1}{4}$ in. electric or pneumatic drill handles average sheet metal cutting jobs.

A heavy duty cutter, also for $\frac{1}{4}$ in. drills, is designed to handle heavier jobs on metal up to approximately 18 ga. By first drilling a hole, cuts inside the sheet may be made.

Angles that require hours to shrink when using old-fashioned methods can be done in a few minutes with a new metal shrinker. By feeding angles through this tool curvature can be obtained without tedious operations.

The partner of the shrinker is the metal stretcher. It is used to form outside curves on angles, quickly and efficiently. Metal remains unbroken, retaining the angle's strength and rigidity.

C-B Tool Co., Lancaster, Penn.



It's the story of the ECONOMY CLUTCH—an amazing GILBARCO development, and the most important oil burner advance in 25 years. Conclusively proved to cut fuel consumption... actually gives more heat per gallon!

There's a Sales Edge for You when You Offer Customers the ADVANTAGES OF THE ECONOMY CLUTCH!

- IT GIVES GREATER FUEL ECONOMY... freedom from heavy soot deposits results in important fuel conservation.
- IT PRODUCES MAXIMUM HEAT... precision atomization assures full burning of the fuel from instant of ignition.
- IT ALLOWS MORE UNIFORM HEATING... closer thermostat adjustment permits more even comfort control.
- IT ASSURES CLEANER HEATING...both inside and outside the heating plant.
- o it OPERATES WITH NEW QUIETNESS... the burner starts and stops quietly, with no strain on the motor.

There's a great sales opportunity with the Gilbarco Oil Burner...one burner that's different...one burner that's better...one burner that can ring up profits for youl

TO DEALERS WEST OF THE APPALACHIANS: Some franchises are still open! They're money-makers for elect dealers. Write or wire for full facts.

Gilbarco

THE OIL BURNER
WITH THE
ECONOMY CLUTCH

WEST SPRINGFIELD, MASS., AND TORONTO, CAMARA

NEW LITERATURE

Use Coupon on Page 116

Cutting Costs Without Cutting Corners is a six page bulletin on new square and rectangular air diffusers, especially designed for acoustical ceilings. Model RTC diffusers are made in modular sizes to conform to standard tile dimensions and the bulletin illustrates installation details.

Sizes, patterns, and typical applications are also shown.

Air Devices, Inc., 17 E. 42nd St., New York 17, N. Y.

Multi-Notcher323

A four page folder shows examples of notches commonly cut by hand in sheet metal shops.

The Multi-Notcher is an inexpensive tool designed to speed up notching, punching, and layout of ductwork and other sheet metal work of aluminum, steel, or tin.

It will cut one to six accurately shaped notches in one operation in metal up to 20 ga. Dies are available for 30, 45, and 90 degree V, Pittsburgh, square, and other shaped notches.

Layout operations are made easy by movable units spaced along bottom and top parallel bars and die units are so constructed that it is not necessary to align each set of dies when they are moved.

Models are available for sheets ranging from 18 in. to 120 in. width.

Fallsington Mfg. Co., Inc., Fallsington, Penn.

Warm Air Heating and Winter Air Conditioning, by John W. Norris, vice president of the Lennox Furnace Company, was originally intended for release to the company's sales and dealer organization but is now released to the warm air heating industry, trade schools, and technical colleges.

In this book an attempt has been made to cover every phase of warm air heating and winter air conditioning and to describe and illustrate all problems, from the simple to the most complex. This has been accomplished in a manner that makes the book not only a technical guide but enjoyable reading as well.

Practical warm air heating engineering, installation, and service constitute the main divisions of the book and these are generously indexed and cross-indexed so that subject matter is quickly identified.

The book can be used for basic warm air heating fundamentals which are essential to effective sales effort and for its practicability as a text for new salesmen, particularly. This latter use is not suggested because of its elementary character but from its logical presentation of the subject.

Experienced warm air heating personnel will find it a valuable guide and reference. Price: \$5.

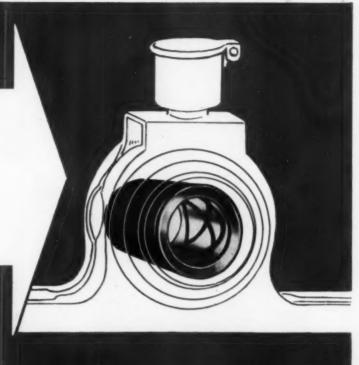
Lennox Furnace Co., Marshalltown, Iowa.

The General CAN INCREASE YOUR SERVICE DOLLAR VOLUME Make profits on every installation. WITH INSTALLATIONS Eliminate troublesome call backs. **Build regular repeat business through** cartridge replacements. Help customers save money by giving cleaner burning fuel. **Build goodwill and customer loyalty** by providing trouble-free operation. General HAS THE RIGHT FILTER FOR EVERY OIL HEATING PLANT! The General is popular with all contractors, dealers and fuel oil service companies because it has proven the best fuel oil filter for heating plants, hot water heaters, and room heaters. The General will prove a profitable leader for you, tool Report after report in our files bear out these statements. For average installations three models, DeLuxe 2A-300, Master 2A-700 and Economy 1A-25, are outstanding leaders in the General line because they are priced to sell easily, built to give long-lasting service, and designed to provide high-degree performance. There is no better time than now in letting General Fuel Oil Filters increase your service dollar volume. Contact your jobber immediately or write direct for information and discounts. <u> Listed: Re-examination Service, Underwriters Laboratories</u> GENERAL FILTERS 12890 WESTWOOD AVE

INCORPORATED

DETROIT 23, MICHIGAN

Here's quality you can see and *SELL*



Selling's easier for you . . . buying's easier for your prospect . . . when you standardize on double-lubricated Randall Pillow Blocks and make their quiet dependability part of your selling story. Carry a Randall with you. Show your prospect how grooves of lubricating graphite are part of the bearing surface. He'll see at once how the grooves are cunningly patterned for complete coverage.

Then explain how oil feeds from big

reservoirs through graphite plugs to the bearing surface . . . double oil-plus-graphite protection that keeps shafts running with silent efficiency for the life of the equipment.

Try it out . . . and see how both shafts and sales go smoother with Randalls. Randall quality costs no more. You select the pillow block that's exactly right from Randall's complete line. Every Randall is double-lubricated, self-aligning, easy to install. Write for Catalog 47.

Representatives carrying stocks

- The Brown Bearing Co. Portland 9, Seattle 4
- The Berry Bearing Company Chicago 16
- Edward D. Maltby Company, Inc. Los Angeles 15, San Diego, Phoenix, Honolulu
- C. W. Marwedel San Francisco, Oakland
- Moffat Bearings Company Philadelphia 30, Baltimore, Richmond, Charlotte, Atlanta

- •Salt Lake Hardware Company Salt Lake City 9
- *Syracuse Bearing Company Syracuse 2, Buffalo 8, Niagara Falls, Rochester 13, Utica
- *Tek Bearing Company Albany, Boston, Bridgeport, Newark, New York, Providence
- Dominion Bearings, Ltd. Toronto 4
- Pumps & Power, Ltd.
 Vancouver
- Goyanes y Alvarez Havana, Cuba

RANDALL GRAPHITE BEARINGS, Inc.

Dept. 911, 609 West Lake Street, Chicago 6, Illinois



Factory Assembled and Wired for Immediate Installation.

Write for Bulletin 802 giving complete specifications on Airtherm Direct Fired Heaters.

MANUFACTURING COMPANY

706 S. Spring

St. Louis

NEW LITERATURE

Use Coupon on Page 116

Bulletin No. 257 describes Electro-P1, a dry type electronic air filter of simplified design and intermediate efficiency in dust removal. It is basically an electronic precipitator without an ionizing unit. An electrostatically charged Airmat paper increases cleaning efficiency over that of unenergized Airmat and is adequate for applications where the requirements indicate the need for better than normal air cleaning but do not justify the higher cost of super-clean air.

Experiments have proven that an electrostatic charge of considerable strength can be applied to Airmat paper and tests showed a marked improvement in Air cleaning. When the paper has collected its full load of dust, it is discarded and replaced with clean material.

This new filter requires neither water nor sewer connections for cleaning, nor spraying with oil to maintain efficiency.

American Air Filter Co., Inc., First and Central Ave., Louisville 8, Ku.

The third of a series of datagrams dealing with moisture problems and their solution is known as SGD-3. The first two datagrams, SGD-1 and 2, dealt with moisture load determination. The third shows the application of air dryers to a basic air conditioning system resulting in independent control of humidity and temperature.

This arrangement is applicable to comfort air conditioning and industrial process air conditioning for any desired temperature or humidity control level.

Bryant Heater Co., 1020 London Rd., Cleveland 10, Ohio

A 4-page folder illustrates and describes Series "C" Pittsburgh gas unit heaters for heating, ventilating and drying industrial buildings. Cast iron heat exchangers are a feature.

Specifications for six sizes, with output ranging from 172,000 to 68,000 Btuh, are included.

Automatic Gas Equipment Co., 301 Brushton Ave., Pittsburgh 21, Penn.

Blades, Wheels and Blower Assemblies328

A folder—sized for a No. 10 envelope—pictures blades, blower wheels and blower assemblies of new design—single wheels, double inlet wheels—of weldless and rivetless aluminum construction, electronically balanced.

Burden Company, 1000 No. Orange Dr., Los Angeles 38, Calif.



Fuel of all kinds is high in cost and may not be too aboutant. People generally are hot to buy anything with which they can save fuel without shivering.

Skuttle Humidifiers are made to order for this market. Their fuel saving feature makes them go like hot cakes with a little sales effort.

With Skuttle Humidification, thermostat control of a warm air furnace can be 3 to 4 degrees lower and the house may be even more comfortable. Oil companies say every degree lowered, saves 3% of the fuel.

The warm moistened air is far more healthful. Desert dry air without humidification decreases resistance to colds, coughs, bronchitis, "flu," pneumonia and sinus troubles.

Skuttle Series 600 Humidifiers—Self Flushing—Self-Cleaning—This feature is a sales clincher—raise a lever

and the Skuttle Series 600 flushes itself, cleaning out lime, muck and dust.

Vapoglas* Evaporator Plates—Pure glass fiber—faster capillary action than any other plate or wick. They assure maximum evaporation.

Skuttle Humidifiers are easy and profitable to sell. And you can sell replacement plates every year at additional profit. Write for details.

*Patents Pending



MANUFACTURING COMPANY 4099 BEAUFAIT . DETROIT 7, MICH.

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Draft-O-Stat—for many years the standard barometric draftcontrol mechanism for boilers,

furnaces, oil burners and stokers—is now available in the MODEL "B" for 6", 7", 8", 9", 10" and 12" fluepipe sizes. Now you can replace all obsolete and inefficient draft controls with the newest development in precision combustion control for the small and medium-size heating plant—achieving a higher fuel economy than has heretofore been possible.

Barometric Draft Control at its Best

The MODEL "B" is the logical first choice of heating engineers, and many manufacturers specify it for use on their equipment. Welded steel construction, die stamped, and finished in red and black baked enamel with polished fittings, it is built for rugged, dependable service. It insures a steady, unchanging rate of draft or "vacuum" in the chimney—thus providing maximum utilization of furnace heat. It is quickly and easily installed, easily adjusted to any degree of sensitivity, and gives long-lasting, trouble-free service.

Features for Better Performance

- · Exceptionally large Effective Area
- Precision Adjustment
- Feather-light Sensitivity
- Self-Cleaning Rocker Bearings
- Maximum Flexibility

Insist on Draft-O-Stat for best results on every heating installation.

There's only ONE

Draft-O-Stat

and HOTSTREAM makes it!

THE HOTSTREAM HEATER CO.

Manufacturers of water heaters and draft controls

NEW LITERATURE

Use Coupon on Page 116

Selling Oil Heating Accessories329

A comprehensive kit of merchandising helps is entitled "Selling Oil Heating Accessories to 4 Million Customers.

The kit includes a list of free newspaper ad mats; a new consumer catalog; an outline of the consumer and trade paper advertising campaign; a booklet describing the AP sound slide film Comfort with Automatic Heating; suggested catalog copy of AP oil heating accessories for inclusion in catalogs; sales bulletins and installation instructions.

h

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Automatic Products Company, 2450 N. 32nd St., Milwaukee 10, Wis.

Bulletin No. 131—2 pages—describes the Chicago steel press brake, dies and attachments. There is also a complete catalog entitled *Forming Press Dies and Their Uses*. Of all steel construction and all steel enclosed gearing, the Chicago Model No. 131 has a capacity of 11 tons. Standard equipment includes lower die holder, vari-speed drive, back gauge and motor and control for two or three phase, 50 or 60-cycle, 220 or 440 volt current.

Dreis & Krump Mfg. Co., 74th & Loomis Blvd., Chicago 36, Ill.

Die Manual—A Handbook of Press Brake Dies, Punching Attachments and Press Brakes is the title of an 88-page book illustrating and describing over 200 press brake dies, ranging from simple bending dies to complex gang punching units.

Detailed information is presented to simplify tooling. Engineering data is included for making metal forming calculations, as well as details and specifications.

Verson Allsteel Press Co., 1355 E. 93rd St., Chicago 19, Ill.

Register Book No. 48 contains 54 pages of illustration and text, showing registers and cold air faces in actual home settings, with list prices for numbers and sizes.

The book is indexed according to the various types, and trade names.

The-Auer Register Co., 3608 Payne Ave., Cleveland 14, Ohio.

A 2-color circular featuring the Fairchild ¼-in. electric drill and the Hi-Power ½-in. model is available. Precision Equipment Co., 2658 N. Long Ave., Chicago 39, Ill.

WITH THE CONTRACTORS

Contractors are invited to write and tell us about their new shops, new locations, new store fronts, display windows, changes in management, etc. Pictures will be appreciated and returned, if requested.

NAROWETZ HEATING AND VENTILATING COMPANY, air conditioning and ventilation contractors of Chicago, held its annual picnic for employees and their families this year at Fox River Grove, near Cary, Illinois. Louis L. Narowetz, president of the 50 year old firm and member of the National Joint Board for the Settlement of Jurisdictional Disputes, his wife, and three daughters greeted the 236 employees and guests.

The outing was one of two occasions each year when the personnel of the company gets together, the other being the annual Christmas party.

Among the guests were officials of Local No. 73, Sheet Metal Workers' International Association, ventilating contractors, and engineers and inspectors of the Chicago Department of Health.

Lawerence O. Paul, vice president of the company, was master of ceremonies during games, races, and other events. Serving on a committee with Mr. Paul arranging the event were Harry Brinker, Stuart Ander-

son, Charles Carson, and Jerry Herman of the executive departments, and the following mechanical foremen: Lawrence Bain, Clarence Dietelhoff, Frank Simnacher, Grant Debes, Martin McCauley, Robert McAuley, Slim Dusek, James Mraz, Joseph Nielander, Charles Cadman, Theodore Bernzen, Jeffery Cuchna, James Bracken, George Toon, Arthur Narowetz, Shannon Troutman, Tom McCauley, and Clint Simek.

CECIL F. PORTLOCK has been appointed manager of the NATIONAL SHEET METAL COMPANY shop, located at the southeast corner of Twelfth and Montgomery, Philadelphia, specializing in general sheet metal work, air conditioning, ventilating, and exhaust systems.

Mr. Portlock has been identified with the construction and engineering field since 1927. He was formerly with the Rust Engineering Company.

Frank J. Foersting

Frank J. Hoersting, 75, president of Hoersting & Holtmann Co., 420 N. Main St., Dayton, Ohio, died Saturday, August 14, at his home in Sarasota, Florida.

Mr. Hoersting had lived in Florida since 1940. He and his partner, Louis P. Holtmann, founded the sheet metal firm on North Main Street in 1902.

Born in Germany, Mr. Hoersting came to Dayton more than 60 years ago. He was a past president of the National Sheet Metal Association.

Surviving are his wife, Mary J.; four daughters and four sons—Frank L., Sarasota and Albert J., Dr. Louis J. and Dr. Leo H. all of Dayton.

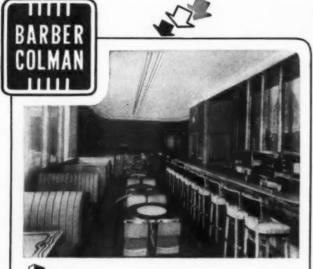
PEXTO FOR BETTER SHEET METAL WORKING This Deep Throat Beading Machine is an example of PEXTO equipment that has been timetested for 163 years . . . with continued refinements in design and operating features. Friction clutch, hand or foot operation, 18

THE PECK, STOW & WILCOX COMPANY Since 1785 SOUTHINGTON, CONNECTICUT, U. S. A.

No. 3617 Motor Driven Deep Throat Beading Machine

gauge capacity . . . plus long-term durability, make

this machine first choice in the industry.





CEILING

These new line-type ceiling outlets can be used singly or end-to-end in continuous strips. They are constructed of scientifically-designed, rolled-steel members all dimensionally coordinated for use with acoustical ceilings and other building products.

A New Approach to Air Distribution

Keyed to modern architectural concepts, LINE-O-FLO, provides a vital contribution to continuity of design. High diffusion efficiency results in rapid induction of room air into the primary stream, quickly equalizing the temperature differential.





Ask for Bulletin F-2741 and get full performance data, dimensions, description, principles of operation, typical installation methods, and suggested uses. Write today. PERFORMANCE DATA
ASSURES ACCURATE ENGINEERING

Knowing the CFM available and the throw required, the number of standard units needed can be quickly obtained from reliable Performance Data tables. Two basic models are made — Model "LS" (shown above) and Model "LL" (designed to receive M21118 DAY-BRITE Lighting Unit).

BARBER - COLMAN COMPANY
1226 ROCK ST. . ROCKFORD, ILLINOIS

INDUSTRY ITEMS

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Late IN July nearly 80 Janitrol sales representatives from factory branch offices and from distributors' organizations convened at Bedford Springs for a three day sales meeting. This was the first general sales meeting of the Surface Combustion Janitrol Heating Division to be held since 1940. Theme and keynote of the entire sales meeting was "Something Old . . . Something New." "Something Old" being a review of Janitrol's progress in the development of gas heating equipment for the past 30 years, while "Something New" pertained to the introduction of new equipment.



The meeting was conducted by Eugene A. Weaver, general sales manager of the Janitrol Space Heating Division. Frank H. Adams, president of Surface Combustion Corp., and C. B. Phillips, vice-president and general sales manager, made key speeches and voiced their optimism for the future expansion of gas heating and the growth of Janitrol sales. Guest speakers included Jack Lacy of Lacy Sales Institute, Boston, and Professor S. Konzo from the Graduate School, University of Illinois.

J. I. Trimble, manager of Columbus Engineering, unveiled the new Janitrol Winter Air Conditioner. This was exhibited to the field sales force for the first time and each of its many features were explained in detail from a cut-a-way model.

Phillip N. Dutton has been appointed company sales supervisor in Ohio and parts of Pennsylvania by Research Products corporation of Madison, Wisconsin. Mr. Dutton was in the industrial equipment business before joining Research. The Company also announced the promotion of John Schutz of its Cleveland Office to an administrative position at the Madison head-quarters.

ROBERT L. BEALL of Greensboro, N. C. and New York City, is now associated with the sales department of Wysong and Miles company, Greensboro, N. C., manufacturers of sheet metal machinery. Frank S. Kaulback, vice president and general manager of branches of the American Radiator and Standard Sanitary Corp. has retired from active service on the company's retirement plan.



Frank S. Kaulback

Robert W. Lang

Mr. Kaulback was succeeded by Robert W. Lang, supervisor of the central division of the American Standard branch house department, who was elected vice president and general manager of branches at the last quarterly meeting of the board of directors at New York.

The retiring vice president had held his position since 1930 and spent 45 years with the company, beginning as a showroom attendant. His successor, Mr. Lang, is a native of Toledo. He joined the Standard Sanitary Mfg. Co., a predecessor company in Toledo in 1914. Mr. Lang will make his headquarters in Pittsburgh and direct the activities of the company's 50 branches from there.

Anchor Post Products, Inc., Baltimore, Maryland announces the appointment of Mr. Edwin F. Long as district sales manager for the Fluid Heat Division.

Mr. Long will have his headquarters in Charlotte, North Carolina and be in charge of Fluid Heat domestic heating equipment sales and dealer activities in North Carolina, South Carolina, and Georgia.

· Mr. Long joined the sales force of Fluid Heat after several years of very successful work with Sherwood Brothers, Inc., of Baltimore, Maryland, one of the country's largest dealer organizations.

GENERAL FILTERS, INC., Detroit manufacturer of fuel oil filters, has appointed Paul R. Jett as factory representative in the St. Louis region. His territory embraces the state of Missouri and the southern half of Illinois.

Dravo Corp., Pittsburgh, has completed the transfer of its main offices from the Dravo Building at 300 Penn Ave. to the former Pitt Bank Building, Fifth and Liberty Ave., which has been renamed the Dravo Building.

Another recent Dravo announcement concerned the appointment of the Tennessee Heating Sales Co., Knoxville, as a distributor for Dravo heaters. The territory that is covered by the firm includes Tennessee, east of the Tennessee river; southwest Kentucky; southwest Virginia and North Carolina, west of Ashville. The company, organized in April, 1947, is headed by R. A. Seepe.



Engineered Air Distribution

venturi-flö

CEILING OUTLETS



FOR QUIET OPERATION and HIGH DIFFUSION EFFICIENCY

VENTURI-FLO Ceiling Outlets of the recessed type, illustrated above, are ideal for those applications where space requirements are limited. They present a pleasing appearance and allow maximum flexibility for architectural design and planning. Fittings are available for attaching any standard lighting fixture to the unit. VENTURI-FLO Outlets can also be furnished as combination supply and exhaust units or with adjustable volume control dampers.

THE VENTURI PRINCIPLE



The VENTURI-FLO air outlet has flow characteristics similar to those of the well-known fluid measuring device—the Venturi meter. The relationship between the neck area of the unit proper and the venturi throat area is so proportioned as to create a slight back pressure in the neck at all times, thereby automatically assuring uniform distribution around the entire periphery of the unit.



Write today for Bulletin F1497-3, giving full information on the various types of VENTURI-FLO units and their applications.

BARBER - COLMAN COMPANY
1226 ROCK STREET + ROCKFORD, ILLINOIS



able effects of winter indoor dusty dryness.



Palmaire corrects the humidity. Protects against chapped, dry skin,-helps bring zestful freshness to complexions, and brilliant lustre to hair. Removes soot, dust, pollen, smoke from the air, reduces the chances of colds and throat infections. Helps relieve hay fever, pollen asthma and catarrh sufferers.



GREATER COMFORT, ECONOMY TOO

Extreme room temperature variations are avoided - fuel and cleaning bills are reduced. Protects furniture and walls from cracking and warping.



Ideal for Homes, Apartments, Stores, Shops, Offices, Florists, Furriers, Convalescent Homes, and Hospitals.

Here's a definite volume-sales-item you can't afford to miss. Be sure to send for your sales data today.

Manufacturers of Palmaire Heaters & Sno-Breze Coolers

GDH	MANUFAC PHOENIX, AR		
Plea	We are Distributors se send sales details on the		
ADDRESS			
CITY	Z	ONE	

INDUSTRY ITEMS

THE LOCKFORMER Co., is now well settled in its new plant which is shown in the photograph. The plant, located at 4615 W. Roosevelt Rd. in Chicago, contains the air conditioned general offices and has several times as much floor space as the previous factory.



The location is such that there is ample parking space available, rail connections are excellent and the expansion and improvement of production facilities has had a marked effect on production schedules of products.

CARROLL M. BAUMGARDNER has announced his resignation as executive vice president and member of the board of directors of United States Radiator Corporation, Detroit, Michigan. He has also resigned as president and member of the board of directors, Capitol Finance corporation, Detroit, Michigan.

THE HERMAN NELSON CORP., Moline, Ill., recently announced the appointment of James D. Hodges as eastern divisional manager of the company's line of portable heaters and portable ventilators.

For the past three years Mr. Hodges has been service manager of the Portable Products Division. Previous to his connection with the company, he was a captain in the Corps of Engineers and saw extensive overseas duty. He is a graduate of the University of Illinois.

E. A. Price has been appointed manager of the New York district office for Penn Electric Switch Co. He succeeds N. E. Jennison who resigned to enter the wholesale refrigeration business. Mr. Price was formerly manager of the company's Dayton and Dallas districts.

Wysong and Miles, Greensboro, N. C., has commenced the construction of a modern foundry which will supply semi-steel, brass and aluminum castings used in the manufacture of its line of sheet metal machinery. The foundry was designed by company engineers and will occupy 20,000 sq ft of floor space.





The New VAILLIAMSON ALL-FUEL FURNACES

BURN OIL . GAS . COAL

- Designed for hand-firing or stoker-firing coal.
- 2. For easily installed, efficient OIL heat.
- 3. For efficient and easy GAS installations.

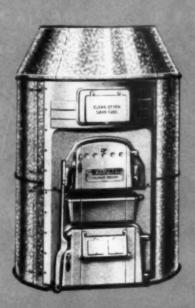
The NEW Williamson All-Fuel units meet any fuel situation. For your customer can burn whatever fuel is available or most economical. And

Williamson All-Fuel Furnaces embody every feature of advanced design and construction essential for efficient operation and heating results.

Look to Williamson for outstanding quality—for your customer's satisfaction and your own business profits. Cast iron or Super-steel for gravity or forced air—Coal-fired, Oil-fired or Gas-fired.

Williamson Standard Cast Iron Gravity Furnaces and Winter Air Conditioning Units are available in sizes from 18" to 28" including all Pipe and Fittings from one source. With these All-Fuel units you are prepared for any fuel situation, for they

are designed for beauty of appearance, efficiency and are readily convertible to Stoker, Oil or Gas firing. Williamson jobbers are in position to make prompt delivery of your requirements. Mail the coupon today for the name of our nearest distributor.











The New WALLIAMSON ALL-FUEL FURNACES

BURN OIL . GAS . COAL

What is the fuel situation going to be next winter? With established gas service being curtailed . . with fuel oil to be in even greater demand next winter . . . and it hasn't been too easy, sometimes, to get coal . . . What's the answer?

You can't heat a home with predictions!

In these circumstances the New All-Fuel Williamson Furnaces are the only safe kind of heating plant to have. You can burn Coal or Oil or Gas. If the supply fails or the cost seems prohibitive you can switch fuels any time you like. We think it's just good business to so advise your customers.

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THE WILLIAMSON HEATER COMPANY

Get the facts - Mail this coupon Today

THE WILLIAMSON HEATER COMPANY

CINCINNATI 9, OHIO

We would be interested in talking with your distributor

Name_____

Company ____

Address

City_____State____



No obligation

INDUSTRY ITEMS

MINNEAPOLIS-HONEYWELL REGULATOR Co., has announced a number of organizational and personnel changes recently.

John R. Bergan has been named head of a new department formed to coordinate and supervise the advertising, merchandising and sales promotion activities of the company. Chandler Murphy has been promoted to the post of advertising manager and John A. Young has been made sales promotion manager.



J. R. Bergan

C. Murphy

J. A. Young V. D. Wissmille

V. Dale Wissmiller has been named supervisor of national accounts and refrigeration for the commercial controls division.

George D. Maves has been named manager of the Boston branch, being promoted from the post of mountain regional manager in Denver. Succeeding Mr. Maves in Denver is Edwin A. Thompson, who has been manager of the Peoria-Davenport office since 1945. Robert H. Jacobs has taken Mr. Thompson's place in the Peoria office.

GENERAL OIL BURNER CORP., Baltimore, Md., has announced the following new factory representatives. John J. O'Connor has the territory including Missouri, Tennessee and Kentucky. Mr. O'Connor has been in the heating industry for many years and will make his headquarters at 660 Enright Ave., St. Louis. Richard G. Bohaker of Boston is covering Massachusetts, New Hampshire, Vermont, Maine, Rhode Island and eastern New York.

Potts-Farrington Co., Philadelphia jobbers, have celebrated their 115th anniversary by moving into new and larger quarters at 4250 Wissahickon Ave. Formerly a heat-treating plant for the United States Navy the building has been completely renovated for the new tenants. Considerable material handling equipment was installed to facilitate the warehousing of the building industry products that the company stocks.

BENJAMIN F. FAIRLESS, president of United States Steel Corporation, recently announced the purchase of the assets of Consolidated Western Steel Corporation by a new United States Steel subsidiary.

Alden G. Roach, president of Consolidated Western Steel Corporation, formerly the Consolidated Steel Corporation, will become president of the new United States Steel subsidiary.

STEEL ANGLE RINGS

Accurately Rolled To Meet Your Specifications



Regardless of whether you are installing a ventilating, dust collecting, fume disposal or any other type of sheet metal pipe assembly, you can speed up, safeguard and improve your work with Chicago Metal Rolled Steel Angle Rings. They are accurate in all dimensions, free from distortion and have a perfectly smooth surface that assures a tight joint. Available in 6"-36" diameters, larger sizes rolled to your specifications.

Write for list of sizes and net price list.

Also Sheet Metal and Heating Supplies

- * Moncrief Furnaces
 - Coal Oil Gas
- * International 85 150 Oil
- * Oil Burners 275 Gal. Oil Tanks
- * Oil Gauges Oil Filters Oil Lifters
- * Blowers Humidifiers
- * Master Blowertrol C. A. C.
- * Controls
 - Minneapolis-Honeywell Samps
- * Western Turbine Ventilators
- * Accurate Ventilators
- * Conductor Elbows Miters Etc.
- * Glatt Gutter Anchors Wire Hangers
- * Sheet Copper Cold and Soft Rolled
- * Blow Pipe Ells Blast Gates

Complete Catalog on Request.

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3733 S. ROCKWELL STREET, CHICAGO 32, ILLINOIS



Now Available! JOHN ZINK'S NEW "Whisper Quiet" UNIT HEATER

Especially Designed
For Installation Requiring
Quiet Operation

More Head Room—Compact Design and More Heat From Gas Burned. A. G. A. approved for natural, manufactured, mixed or L P gases. Fully equipped with automatic Controls.

HURRICANE MODEL AVAILABLE FOR INDUSTRIAL INSTALLATIONS

Write for Literature

John Zink Company

4401 South Peoria

TULSA, OKLAHOMA

New York - Salt Lake City - Houston - Los Angeles

INDUSTRY ITEMS

BRYANT HEATER Co., Cleveland, Ohio, has announced the appointment of Karl W. Schick as distributor for Dallas, Texas.

Schick has a long record in the selling of heating equipment of all types and had been associted with the Minneapolis-Honeywell Regulator Co. in various capacities. Most recently he was regional manager of the southwest division of Minneapolis-Honeywell and had his deaquarters in Dallas.

Mr. Schick will operate his firm under the name of Bryant-Schick, Inc., and he and his staff of engineers will supply advisory service to dealers, architects and builders.



Karl Schick



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Wendell Franks

SKUTTLE MFG. Co., Detroit, has appointed two new factory representatives. Walter B. Stamberger is covering the eastern half of New York and half of New Jersey. A graduate of Boston College, Mr. Stamberger had been affiliated with William Debler & Sons.

Wendell Franks has the territory that includes northern Indiana, northern Illinois and Wisconsin. A graduate of Texas A. & M., Mr. Franks spent several years in the army in manufacturing and research arsenals of chemical warfare.

THE COLEMAN COMPANY, INC., has purchased the La Porte, Indiana factory of Hoosier Industries, Inc., and will manufacture a complete line of automatic water heaters in both oil and gas burning models. Leo P. Corsbie, president of Hoosier Industries, has been retained as general manager of the Indiana plant.

FEDERATED METALS, division of American Smelting and Refining company, has opened a new production unit at the company's Houston plant. The new unit will manufacture solders, bearing metals, lead ingot, battery metals, type metals and special white metals alloys. This is a part of the long range development program which Federated has planned for the Gulf Coast area.

REPUBLIC STEEL CORPORATION has opened its new Enduro Plant No. 2 in Massilon, Ohio. A considerable increase in the production capacity of stainless steel sheets will be effected by this new plant. Enduro plant No. 1 can roll flat stainless steel in widths up to 30 in.; the new plant, nearly double this width.

(From page 82)

Furnace Blower Manufacturers' Association

THE EDGEWATER BEACH HOTEL, Chicago, was the scene of the annual meeting of the Furnace Blower Manufacturers' Association during the last mid-year meeting of the National Warm Air Heating & Air Conditioning Assn.

The newly elected officers for the coming year are, President, Thompson Morrison, Morrison Products Company, Cleveland, Ohio; Vice-President, Tom Byrd, Lau Blower Company, Dayton, Ohio; Secretary-Treasurer, Ward Brundage, The Brundage Company, Kalamazoo, Michigan. The retiring officers, Homer Brundage, The Brundage Company, President; and Ben Krause, Air Controls, Inc., Vice-President, have served in those capacities for the past two years.

Progress Report No. 4 was presented to this Association by Norman Buckley, special research assistant at the University of Illinois Mechanical Engineering Department. Report No. 4 covers the Performance of Blowers "A" and "B" in Gas Fired "High-Boy" Furnace. This engineering program was initiated two years ago and is sponsored by the Furnace Blower Manufacturers' Association in cooperation with the National Warm Air Heating and Air Conditioning Association and the University of Illinois. The Blower Association recognized the need in the industry of a method of measuring the pressure drop through a blower-furnace combination, and also a determination of the factors that affect pressure drop.

New Oil Production Record

IN ITS EFFORT to meet constantly increasing demands for more and more petroleum products, the American petroleum industry achieved a record daily average domestic production of crude oil of 5,504,550 barrels in the week ending August 7.

This is 7.8 per cent above the corresponding week of 1947 and 11.3 per cent more than the daily average for the peak week of World War II.

Translated into gasoline, this thumping one-day production would provide gasoline for 328,590 average passenger automobiles for a year. As fuel oil, it would heat the average home for more than 115,000 years. If one day's production were all diesel oil, it would be sufficient to drive a modern railroad train 5,000 times around the earth at the equator.

One of the results of this unprecedented production has been that the largest crop in United States' history is being grown and harvested with no shortages of petroleum products, according to petroleum distributors serving the bread basket and the corn belt of the United States.

Records of the American Petroleum Institute show that the last pre-war year of 1941 peak production of crude oil in the United States was 4,336,850 barrels daily for the week ended November 22.

Current Construction Outlook

LATEST ESTIMATES by the Bureau of Labor Statistics indicate that about 2.4 million construction workers will be employed by construction contractors in September, peak month of activity. All figures seem to



far more severe — far beyond — normal warm air furnace operation. That's why you can use it with complete confidence. It's the best insurance in the world of a gas-tight, smoke-tight job — of jobs that bring credit to your foresight and workmanship. No costly complaints, no doing the work twice — with Armstrong's THARCO. Your jobber can supply you, or write us for complete information.

THARCO
Will not shrink,
check or powder!

THARCO
For easier
application!



NEW EQUIPMENT means BETTER ELBOWS for you

CINTI ELBOWS

There's an old saying about a chain and its weakest link that might apply just as well to elbows. You just can't erect a perfect sheet metal downspout job unless the finest elbows are used.

The Cincinnati Elbow Co., with its new automatic equipment and elbows hot-dipped after formation, makes this possible.

Use the new Cinti Elbow and rest assured of a job well done.

Ask Your Jobber for Them

The Cincinnati Elbow Co. 2627 Colergin Avenue

Cincinnati 14, Ohio





point to the expenditure of a record \$18 billion for new construction this year, 20 per cent over the estimates made last December by BLS and the Office of Domestic Commerce.

Latest information on the number of dwelling units provides a possible total for the year of 950,000 privately financed and 7,500 publicly financed.

There were 94,000 housing starts in July and the total for the first seven months is about 540,000 units.

NWAH&ACA Announcements

AT THE RECENT MID-YEAR CONVENTION of the National Warm Air Heating and Air Conditioning Association, M. I. Levy, president of Viking Air Conditioning Corporation, Cleveland, Ohio, was appointed chairman of the Publicity and Merchandising Committee of the Association. Mr. Levy was appointed to succeed Mr. C. L. Rowley of Owens-Corning Fiberglas Corporation, Toledo, Ohio, who found it necessary to resign as committee chairman although he will continue as a member of the committee. Appointment was made by Atlee Wise, president of Wise Furnace Company and president of the National Warm Air Heating and Air Conditioning Association.

New appointee to the Publicity and Merchandising Committee was E. R. Champion, advertising manager of the Lennox Furnace Company, Marshalltown, Iowa, while Mr. John Burrows of the Lau Blower Company, Dayton, Ohio, was made a new member of the Association's Research Advisory Committee.

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The 35th Annual Convention of the NWAH&ACA will be held at Hotel Cleveland, Cleveland, Ohio, on

With It's 54 Years of Engineered

WHEN YOU THINK OF HEATING EQUIPMENT



Quiet, Economical, Space Saving, Zeph-Air Oil Burn ing Furnaces, Easy To Operate, Easily Installed

Remember

XX CENTURY



Completely Automatic Air Conditioned Gas Furnaces With The Famous Geas Shaped Cast Iron Radiation Surfaces.



COAL

Efficiency in The Heating Field

It Pays To Push Zeph-Air Heating Products - Thousands of Satisfied Users All Over The Country Remember The Dependability And Reliability Their Zeph-Air Furnaces Stand For.

When a Zeph-Air Furnace Has Ended Its Long-Life and Is Ready To Be Replaced - The Customer is Almost Sure To Say — "Years of Uninterrupted Service," "Install Another Zeph-Air."

Cash In On This 54 Years of Customer Satisfaction — Stock Up On Zeph-Air Heating and Weather Conditioning Equipment - Now.

XXTH CENTURY HEATING & VENTILATING CO.

96 IRA AVENUE

AKRON, OHIO

BARBER BURNERS

Mean Top Efficiency on Any Gas Appliance





For hundreds of gas appliance makers, Barber furnishes countless types of burner units. It also provides full engineering and laboratory testing facilities for the design and development of burners. Barber will originate and build the proper unit—in shape, size, type of jets, fuel capacity, and any special features—to suit your specific appliance. Merely burning gas is a different story from competent combustion engineering, in cost and results. For all appliances operated on natural, manufactured, or LP Gas, you can be sure that Barber will supply the finest performing burners.

For conversion uses, Barber automatic burners come in shapes and sizes to suit the heating needs of all types of furnaces and boilers. Their patented impinged jets employ a vastly superior combustion principle. There is no comparison at all between the common conventional mixer-type burner and the Barber vacuum pre-mixture design. Equip your conversion jobs with genuine-Barber

Listed in A.G.A. Directory of Approved Appliances. Ask for new Catalog and prices on conversion burners, appliance burners, and pressure regulators.

THE BARBER GAS BURNER CO.

3704 Superior Avenue

Cleveland 14, Ohio



BARBER

Gas Burners

SEPTIC

TANKS



Two Sizes . . . 300 and 500 gallon capacity. 14 Gauge Steel, Black Asphalt coating.

AVAILABLE

FOR DELIVERY!

Top quality steel tanks, fabricated by a manufacturer with over 55 years' experience. Write today for prices and complete delivery information.

BLACK, SIVALLS & BRYSON, INC.

24th Floor, Power and Light Building, Kansas City 6, Missouri

Capacity, 275 gallons. 14 gauge black steel, or aluminum. . . . Legs not included.



BASEMENT

MODERN AIRE OIL-FIRED

Winter Air-Conditioning Units
NOW READY FOR DELIVERY

also

Fittings • Registers • Sundries

REPAIR PARTS

for.. Stoves • Furnaces • Boilers

YOUR COMPLETE HEATING NEEDS CAN BE FILLED BY BUYING AT—

DES MOINES
STOVE REPAIR COMPANY

DES MOINES, IOWA

SINCE 1369

December 9 and 10, 1948, George Boeddener, Association secretary, announced. Plans are already under way for arranging a convention program befitting the celebration of three and one-half decades of Association activity in behalf of the industry. December 7 and 8 will be devoted to the annual meetings of the Association's Board of Directors and Committees.

Concrete Slab Bulletin

How to build a warm, dry concrete floor for a basementless house has been told by the University of Illinois.

After nearly a year of research, during which nine different types of floor slabs were tested in a special laboratory, the University recommends:

1—Good drainage, with a 4-in. fill of coarse washed gravel or crushed rock under the floor slab.

2—A vapor barrier, consisting of a ½-in. rigid asphalt board or of reinforced duplex paper with asphalt center, over the fill and extending to the outside edge of the floor.

3—At least 2 in. of rigid waterproof insulation along the exposed edge of the floor and extending 2 ft under it.

The research was carried out by the Small Homes Council and the mechanical engineering department at the University, which reported its findings in a 4-page non-technical circular titled "Concrete Floors for Basementless Houses." Copies can be obtained free for a limited time. The project was under a cooperative agreement with the U. S. Department of Commerce.



A SURE-FIRE OIL-SAVING

KRESKY FLOOR

Will Keep Your Customers Warm and Care-free This Winter



A secret of KRESKY'S low-cost, trouble-free operation is the famous patented KRESKY Oil Burner, basic unit in all models. It inducts air into the oil flame in just-right amounts by an electric blower to give fast, high-low clean heat in all climates and altitudes, regardless of draft conditions. That's why a precision engineered KRESKY Floor Furnace provides your customers with abundant, clean healthy heat, evenly distributed along floors, into drafty corners, with less oil consumption. Your customers are freed from daily attention, and costly service calls.

Now's the time to replace old-fashioned space heaters with KRESKY FLOOR FURNACES

Get your "replacement" story-now-to people with bulky and unsightly space heaters, and beat competition by a month or two. For those who install the Kresky Floor Furnace, it means more "living" space, cleaner, faster heat at less cost. And for you, more profits. Feature the All-Year-Round KRESKY line.

If interested in a dealership, write

KRESKY MFG. CO., INC. 320 H STREET, PETALUMA, CALIFORNIA

The Best Known Name in Oil Heating Since 1910

Profit by this Help all your Oil Heater great ACCESSORY Customers to Oil Savings great ACCESSOR and Extra Comfort with Accessories Accessories

How many of the nation's 4 million oil heater owners are in your community? They're ALL ready prospects for . . .





A-P HEAT REGULATOR SETS for Thermostat

OILIFTERS to end Oil Handling

and A-P FUEL OIL TRAP-ITS to Keep Oil Lines Clean

. . and every one will be a mighty satisfied customer, too, when they realize the convenience and economy of AUTOMATIC CONTROL on their vaporizing oil burning appliances.





Crise furnishes everything needed for easy installation including a LIMIT CONTROL and SPRING RETURN that are usually considered extras.

SELL ON SIGHT - RETURN BIG PROFITS

Your customers want the luxury of automatic draft regulation. Your prospects are limited only by the number of hand-fired furnaces in your neighborhood. The Crise is priced for volume sale at liberal margin. And you can't sell a better control. Cash in now on the vogue for automatic heat. Write for name of nearest jobber and ask about our "sell-on-sight" merchandising plan.

Over 750,000 in use!

T-80 THERMOSTAT
Sensitive two wire, low voltage thermostat—
suitable for operating gas valves, relays, motors,
etc. A fast selling replacement item.



SMCNA Survey

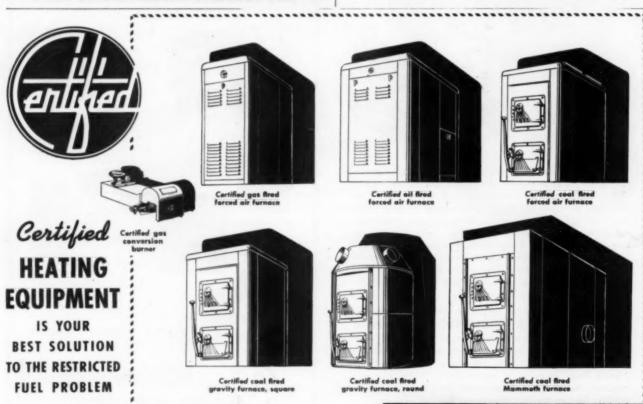
(From page 73)

On June 29, representatives of the Trade Relations, Committee met with Mathias Niewenhous, Consultant, OIC, and presented a copy of the survey. Mr. Niewenhous explained how the voluntary allocation program operates and described two committees representing jobbers which are expected to function shortly. The manufacturers of warm air furnaces, blowers, registers and prefabricated pipe have an industry advisory committee and have received an allocation of 212,600 tons of steel for the period July 1, 1948 to February 1, 1949.

On the basis of the facts contained in our report, OIC will study immediately: (1) should the contractors have their own industry advisory committee; (2) should the contractors be represented on one or both of the jobbers advisory committees; (3) what can be done to bring the producers of aluminum into a voluntary program; (4) how much aluminum can our contractors look for if aluminum producers agree to cooperate.

Housing Needs Steel!

The OIC is immediately concerned with obtaining enough steel to insure completion of one million new homes in 1948. Your Trade Relations Committee's suggestion was that if 125,000 tons of steel have been allocated for the production of warm air furnaces between July and next February, our report of a need for 300,000



The easy conversion of Certified Furnaces from one fuel to another helps solve today's uncertain restricted fuel problem. A Certified Furnace takes come of your customer's comfort now, and later.. permanent satisfaction. Certified Furnaces are right... right for immediate use in any locality.. right for tomorrow's changing conditions.

DIVISION OF STAINLESS & STEEL PRODUCTS COMPANY

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AM

INDEPENDENT "Fabrikated"



REGISTERS AND COLD AIR FACES

"Fabrikated" products were originated by Independent and are backed by 50 years' experience in the register field.

Standardize with Independent "Fabrikated" floor faces and registers. You will have a source of supply of proved dependability. Complete information will be supplied to you gladly on request.

THE INDEPENDENT REGISTER CO.

3747 E. 93rd St., CLEVELAND 5, OHIO

Extra Profits In Blower Installations

Vent-General Purpose
CAST ALUMINUM

UTILITY BLOWERS

V-5-6" (less motor) - - - \$19.00 Net

V-10-7" (less motor) - - 24.00 Net

V-20-9" (less motor) - - 36.00 Net

SIZE	INLET	OUTLET	WHEEL DIA.	CFM	REC R P M	REC H P
V-5	6"	6"	61/4"	550	1750	1/4
V-10	7"	7"	71/4"	1180	1750	1/3
V-20	9"	9"	93/16"	2280	1750	34 or 1

Blowers are of light weight, sturdy, cast aluminum—non-sparking. Standard diameter inlet and outlet—fit stock size pipe. Adjustable base—fits any standard motor. Adjustable discharge—rotates to four positions. Wheel statically balanced.

We Can Supply Motors for Each Unit, If Desired

MAXIMUM AIR DELIVERY . MINIMUM OVERALL SIZE AND WEIGHT



Installed with used or new motors—VENT-AIR provides a compact, efficient blower set that permits you to make a good profit for your time and trouble. Order a VENT-AIR today. Send purchase order or cash. Shipped F.O.B. Detroit.

Fried Air-Kool Co.

8205 LYNDON DETROIT 21, MICH.



Shear fast with SKIL Shear ... and you'll save both time and money! With just one hand to guide it (SKIL Shear weighs only 51/2 lbs.), this powerful tool cuts hot rolled steel up to 16 gauge. Close-tolerance cutting is easy . . . on curved or straight lines . . . because SKIL Shear design leaves cutting blade always in sight of operator. Precision-built . . . quality-built to give you greater savings and finer work through long productive service. Ask your SKIL Tool Distributor to demonstrate SKIL Shear today!

SKILSAW, INC., 5033 Elston Ave., Chicago 30, III. **Factory Branches in Principal Cities** Canada: SKILTOOLS, LTD., 66 Portland St., Toronto, Ontario

tons of sheets to complete these installations is in line with practice

For the erection of pipe and duct work for the ventilation, air conditioning and blow piping of public buildings, schools, hospitals, apartment houses, commercial establishments and factories, the Trade Relations Committee was advised that the Steel Products Committee in the Department of Commerce must be consulted. To men in this department our survey and plea will be sent. The results of our contact will be announced as soon as possible.

Voluntary Allocation Plan for Oil

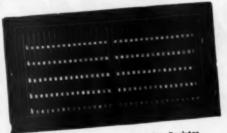
Secretary of the Interior Krug has ordered into effect a voluntary plan for the oil industry to meet petroleum shortages next winter. The industry is free to use the plan when and if oil or gasoline shortages develop.

A similar plan hastily developed last winter helped avert shortages in some parts of the nation. The new plan provides for appointment by the national petroleum council of district committees composed of all segments of the petroleum industry. These may appoint local subcommittees.

Each committee will make recommendations from time to time for voluntary action by the industry to:

- 1) Adjust refinery yields where advisable to prevent shortages, that is, increase output of one specific scarce fuel, with a corresponding reduction in the output of another.
- 2) Distribute petroleum products more effectively to prevent or alleviate hardship to consumers.

AIR-VANE FORCED AIR REGISTERS



Made By ROCK ISLAND . . . You Know They're Good!

No. 802 AIR-VANE Forced Air Register

Quality of equipment is essential to the performance and life of any modern forced warm air heating installation.

You'll find that Rock Island's AIR-VANE Line will fill the bill for you on the most exacting jobs. They're constructed with vertical or horizontal vanes for right or left or downward deflection of air flow. Multi louvre dampers for closured to the construction of t ing and 15 degrees downward directional air flow are standard. This versatile model is also available with single louvre Check the complete Rock Island line . . . if it's a Rock Island Register you KNOW it's good. in wall or baseboard registers.

ROCK ISLAND REGISTER CO.

2435 FIFTH AVENUE

ROCK ISLAND, ILL.





More comfort for customers

-- more profit for you with

Peerless Oil Master

Here's the compact, economical oil furnace that gives your customer the utmost in automatic heat for cold-weather comfort and year-around convenience. It's the Peerless Oil Master, with exclusive baffle design that sends billows of clean, cheery, filtered heat through every register. Ruggedly built for years of efficient, low-cost service. Write for full details on the tremendous profit potential that is yours when you sell the Oil Master and the complete line of Peerless furnaces, and Repair Parts.

PEERLESS FURNACE COMPANY

INDIANAPOLIS 7, INDIANA

Pioneers in Warm Air Heating for Almost Half a Century



Kruckman— Washington Letter

(From page 75)

directly. It became quite clear that Wallace is not using the people who are the steam behind the Progressive Party, but that the radicals are using Wallace as the front for their much more efficiently planned and administered program. Henry was fuzzy and foggy in all his actions: but the crowd who ran that convention had the situation better in hand than even those who ran the Republican and Democratic Conventions. (Cliff Stratton says the correct way is to call it the Democrat Convention.) They had over 4,000 delegates and alternates, representing every State, Territory, Possession and District of the United States. Every session was jammed to the top rafters of the Auditorium with guests who were there mainly because they wished to register their approval of the Convention of Protest. Bear in mind, many of them paid for their tickets. The other conventions were free-at least in theory. Actually, many grafters carried on a brisk bootleg business with the tickets that were distributed among the faithful.

Delegates Pay Their Way

The delegates to the Progressive Convention came at their own expense. This reporter met one man who had come from Alaska. He is a keen-minded individual



AMER

CHAMPION

GAS and OIL BURNING

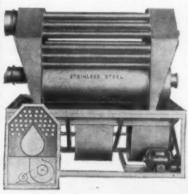
- DIRECT FIRED -



HEATER

National Champion heaters are now available in full range of capacities and styles to insure proper selection for any size and type building. Industrial units as pictured are the proven method of heating factories, garages. and warehouses.

Special models, employing supply and return ducts, integral air filter assembly, and resilient mounted blower motors, are designed for churches, schools, and theaters.



View with easing removed illustrates the compactness and stability of heat exchanger and multiple blower section. Stream. lined firebox of 'lifetime' Stainless Steel eliminates the inconvenience of refractory lining. Tear Drop design and full three pass convector tube arrange-ment (as diagramed) means complete, efficient air wipage of all heating surface at minimum re-

A HEAVY DUTY FORCED AIR UNIT FOR LARGE SPACE HEATING REQUIREMENTS

GENERAL CAPACITY DATA							
Model Number	B.T.U.	Ć.F.M.	H.P.	Dimens Length			Approximate Shipping Weight
T.D 25	250,000	3,600	3/4	60	32 32 32	81	1,300 Lbs.
T.D 40	400,000	5,400	1	60 60 80 80 80	32	81 81 81 81	1,350 Lbs.
T.D 50	500,000	6,600	11/2	80	32	81	1,780 Lbs.
T.D 70	700,000	8,800	2	80	32	81	1,855 Lbs.
T.D 80	800,000	10,200	2	80	48	81	2.110 Lbs
T.D100	1.000.000	12,500	3	80	48 48	81	2.200 Lbs
T.D125	1.250.000	15,300	5	100	54	103	3,000 Lbs.
T.D150	1,500,000	19,400	5	100	54 54	103	3,250 Lbs.

FOR COMPLETE INFORMATION WRITE

NATIONAL HEATER COMPANY

CLEORA & VANDALIA STREETS SAINT PAUL 4, MINNESOTA



... Easier to Sell More of Them

* This is not just another "ad." It's an opportunity for YOU to handle the best-engineered, the finest-built line of automatic humidifiers offered

★ Maid-O'-Mist Convectors have patented features which enable them to "run circles" around older type equipment . and yet, due to simplicity of design and modern mass production, our prices are amazingly attractive.

* You have only to check with your jobber-or write us for complete informationto know the truth of these statements. Definitely will it pay you to FIND OUT.

LOOK!

(A) FLASH ACTION (A) copper trough transmits heat to water NINE times faster, and-

(B) 30% MORE evaporating area—you can guarantee adequate humidity on every type of installation.

(C) 60% LESS air restriction—very small units; practically no throttling of heat flow through plenum.

(D) 50% LESS time to install—cut small opening in plenum, snap in unit (self-locking front plate), make water connections— that's all!

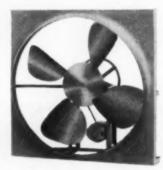
3213 N. PULASKI RD. CHICAGO 41, ILLINOIS



Get the Profits You Missed Last Summer

MURRAY
ATTIC FANS
NOW

"The Fan that does its work in a Whisper"



Selling Murray Attic Fans can mean year-round profits for you.

Now is the time to follow up last summer's inquiries, to follow leads from satisfied installations. Every new construction, every remodeling job is a potential sale for Murray Attic Fans. Homes, offices, stores need Murray Attic Fans.

The Murray Attic Fan does its work in a whisper, gives trouble-free operation, is easy to install, can be financed through FHA, assures you satisfied customers. For extra profits in your business—install Murray Attic Fans now.



MURRAY SALES INCREASERS KIT: Includes Installation Manual, Newspaper Mats, Consumer Folders, Radio Announcements. Add to your profits by using this pretested sales material. Available free to Murray Attic Fan dealers.

THE MURRAY COMPANY OF TEXAS, INC.

DALLAS, TEXAS

ATLANTA, GEORGIA

with no means. He had started with nothing but transportation from Alaska to Seattle. At Seattle he washed dishes and performed other menial services to accumulate a small stake. Then he beat his way eastward by thumbing rides, riding the rods, and stopping. occasionally to do some more dish-washing or whathave-you. Arriving finally in Philadelphia, reasonably brushed and neat, in something equivalent to working clothes, but nevertheless rather striking and pleasing. They did not by any means all work their way from distance points to participate in the convention; but the spirit of this man is rather typical. They were in Philadelphia to demonstrate that they were in active vocal opposition to things as they are, and in opposition to those who are trying to take over the next four vears of Government.

Youth Predominates

It was clear in the Convention itself that the assemblage at Philadelphia was at least to the extent of 60 per cent under the age of 30 years. At least 30 per cent of the entire 4,000 delegates and alternates were women; over 30 per cent were Negroes; another 30 per cent were Semitic, mostly Jews; and about 15 per cent to 18 per cent were either Slavs, Mediterraneans, Balks, or from other parts of the Near East. This left somewhere between 12 per cent and 15 per cent who were fair-skinned, blue-eyed, and blonde, either actually or temperamentally, who represented the British, Scandinavian, German, Irish, and similar race groups which have lived longer in this country than the others. This minority, obviously, are the individualists of the



PENN-AIRE FURNACES

GRAVITY, CAST IRON

Popular Price Practical Design Economical Operation

UNION MANUFACTURING CO., INC.
BOYERTOWN, PA.

AME

There is Profit in Comfort



BLOWER FILTER UNITS



FRONT VIEW

Customers expect comfort-and savings-from their furnace blowers. That's why wise dealers demand REX AIR-PAK Blower Filter Units. A choice of delivery ratings that range from 40,000 to 400,000 Registered b.t.u. per hour meet individual requirements so accurately that costs of heating systems are kept at a minimum. In this wide choice your customer is certain to find the exact REX to fit any need.

REX AIR-PAK brings more than the solid comfort found in controlled circulation of heated, filtered, humidified air for Winter Air Conditioning. It brings savings in fuel, too! A double value for your customer that means double profits for you.

Right now, when furnaces are idle -for their annual overhauling-is the best time to sell forced warm air heating. Cash in with the REX AIR-PAK -the best in Blower Filter Units. Write today for our catalog No. 253 for detailed information.





REAR VIEW

CONTROLS-INC-> THE CLEVELAND HEATER CO.

2310 SUPERIOR AVENUE CLEVELAND 14, OHIO

You'll Sell Your Customers More When You

Sell Them Clipper

Not only do Clipper automatic gas-fired furnaces with the Multi-Stream Heat Exchanger offer efficient economical heating, but also modern air conditioning for the greatest living comfort.

Clipper gas-fired units and also on the details of a profitable sales represen-

tation plan, fill out and mail this coupon.

COMPLETE RANGE OF SIZES. Clipper furnaces are built in a range of sizes from 80,000 to 200,000 BTU.

> COMPETITIVE PRICES. Despite their fine engineering, heavy gauge metals, highly improved controls and other features, Clipper gasfired furnaces are priced in competition with ordinary furnaces.

> IMMEDIATE SHIPMENT. Due to the size of the Henderson plant, equipped with the most modern machinery and to the fact that the plant is located in one of California's most productive climates where steady home-owning mechanics are available, we are able to give you immediate shipment of any model.



amel finish, the Clipper is attractive for installation anywhere. Clipper units are easily installed even in a small closet. All Clipper furnaces, regardless of size, are shipped to you completely assembled, com-pletely wired and individually tested at the factory.



Here is a typical Clipper air-conditioning fur-nace with front panels removed to show easy accessibility of controls, blower and burner

HENDERSON FURNACE AND MFG. CO.

SEBASTOPOL, CALIFORNIA

Henderson Furnace and Manufacturing Co. Sebastopol, California

I am interested in the sales opportunities of Clipper furnaces. Please send me complete information.



Install this 40,000 B 7U Heater between Four-Inch Studs!

THE NEW Magic-Aire double heater is only 1414" wide x 58%" high. It is designed to install between normal standard wall studs without wrecking any studding. Magic-Aire is the easiest panel heater to install that's on the market today.

Yet the double model Magic-Aire has 40,000 BTU input! Magic-Aire heat is uniformly spread to far corners and to other rooms by air circulation, the accepted method in the warm air industry. No excessive heat loss. Heat is projected both sides of the wall. No danger from overheat near the heater.

Non-vision air-circulating grilles project heat away from heater - out into the room and improve the already attractive appearance of the unit.

Ideal for concrete floor homes, apartments, upper stories - wherever floor furnaces are impractical.

Single Unit 20,000 BTU
Double Unit 40,000
Natural or LPG GASES
AGA Approved
Write Today for Illustrated Folder

Distributor Territories Open

No Framing Required to Install

THE A C COMPANY

National Sales Representatives Wire & Metal Mfg. Co., Los Angeles

1315 E. 7 ST.

LOS ANGELES 21, CAL.

world. This aspect of the character of the assemblage was sharply apparent in their obedient submissiveness to their leaders. At the Republican and Democratic Conventions it took from 20 to 40 minutes of patient pleading on the part of the Chairmen to induce the delegates to clear the aisles in order that the business of the sessions could proceed. The snappy orders of the Progressive Chairmen were obeyed by the delegates to the Wallace Convention in not less than ten minutes, and more often in less than .5. It was definitely clear that this group was accustomed to regimentation in a big way. It also was very clear that the leadership took some of its tempo from the youngsters who had so recently come out of the schools and colleges and universities that they were not yet quite dry behind their academic ears. You could feel their smugness, and their assurance that everything that had gone before in the world's evolution had been wrong, and that they knew the sole answer to the ills of the world. The Convention was very emphatically a gathering of protest, led by many minds that were only slightly less half-baked than those whom they lead. It was an emotional orgy, a sort of Billy Sunday political revival, headed by calculating individuals, who knew how to use music, songs, gross and crude appeals to hatred and discontent, in order to stir the 25,000 to 30,000 to a near-frenzy of approval or disapproval.

Appeal to "Liberals"

It was appealing to the category of humanity we used to described as long-haired men and short-haired women. They like a little license with their living. The





All steel welded construction, capacity to 18 ga. soft steel. Top knife bar strongly braced and provided with adjustable bronze gibs to compensate for wear. Blades of highest grade tool steel tempered and carefully ground to give maximum service before regrinding. Adjustable front and rear gauges, quickly set for different sizes. Spring actuated hold-down will clamp material firmly to the bed.



To Cut Material 36" Wide To Cut Material 42" Wide To Cut Material 52" Wide All prices F.O.B. Chicago-Prompt Shipment gall

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Exclusive Distributors 126-128 SO. CLINTON ST. CHICAGO, ILL. Phone ANDover 3430

YOU, TOO, WILL PREFER TURNER'S LOW-PRESSURE



Compare These Features ...

Ready for operation in 5 minutes • Fuel capacity one gallon; burns for 9 hours on one filling Safer...reduces fire hazard of old-style charcoal burners Soldering iron rest keeps points of soldering coppers out of direct flame... saves re-tinning Complete with Turner's exclusive "carburetor control"... providing solid blue flame with more perfect combustion; also a flame control - for exact heat desired — which automatically cleans the orifice, thereby eliminating need for separate cleaner wire • Construction assembly permits quick, easy accessibility and cleaning...windshield, top-plate, and bail handle are one unit, and can be lifted from tank in five seconds by loosening one wing nut • Burner coil made of extra-heavy seamless steel tubing...protected by sturdy outer jacket that maintains heat without overheating ... can be generated and used in heavy wind.

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THE TURNER BRASS WORKS

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you get dividends when ordering Heating Equipment!

Anchor now offers you a SINGLE SOURCE for buying every type of heating equipment. By purchasing all your requirements here, you help yourself 2 ways. First, you save time and trouble. Second, by concentrating purchases at a SINGLE SOURCE, you become a preferred volume buyer. These are the bonuses you receive.

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Write today for literature on any or all these ANCHOR products. Anchor Division, Stratton & Terstegge Co., Inc., P.O. Box 311, New Albany, Ind.



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OIL FIRED FURNACE

With Automatic Winter Air Conditioner.



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Round and square cased types . . . from small home-heating sizes to heavy duty models for industrial plants.



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OIL BURNER

Fully Automatic . . . The Ideal Conversion Unit.





For Hot Water or Steam Tank or Tankless.

Also manufacturers of ROUND OAK
Gos & Electric Ronges

Speed Up Orders With a

BEVERLY SHEAR

Throatless shears that cut any shape . . . straight, circular or irregular. FASTER — accuracy! Order No. 1



for 14 gauge. No. 2 for 10 gauge. No. 3 for 3/16 inch mild steel and 10 gauge stainless. Available with or without stand.

BEVERLY SHEAR MFG. CO. 3001 W. 110th Place Chicago 43, III. Convention was by all means the best organized gathering of the three. We found upon enquiry that the great job of organization had been carried through by the paid, professional organizers who are part of the machinery of the CIO unions. They had not only actively helped with the organization, but they had trained others in the art. And we found that the visible funds used to pay for the great job apparently had chiefly come from the unions, CIO, AF of L, and even the aristocratic Railroad Brotherhoods, and other independent unions. Most of the visible money presumably came from the CIO unions. They are the radicals of the labor movement. Where the invisible money came from you may guess as easily as we might.

Planning for 1952

Finally, remember, they do not expect this time to elect Wallace or Taylor. But they do expect to pack the Congress with their chosen candidates. They are focusing every possible effort upon the door-bell-ringing campaign, conducted by the faithful, who work without pay, with intense conviction of the rightness of their cause, and in utter sincerity and complete devotion to the faith which is sometimes Socialism, sometimes Communism, but never the Democracy which is the essential foundation of the America which we know, or have known. They believe chiefly in subordination of the individual to the good of the mass. And they think that when 1952 comes around so much will have happened in the United States, and elsewhere in the world, that they will have no difficulty in taking over the Government in that quadrennial election.

This fall and winter season is going to be a very busy one for both you and us.

We are making and shipping all of the famous

HANDYPIPE

that availability of sheets makes possible. Like many firms today, we are filling every order with the utmost possible speed.

F. MEYER & BRO. CO., PEORIA, ILL.

"The Handy Pipe People" Since 1866.

Save yourself TIME and MONEY



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INVESTIGATE MADE-RITE CONNECTING LOCK STRIP

Patent Pending Here's a time and material saver for speedy and air tight installations of trunk line and wall stack fittings with all the "Know How" of years of experience in the manufacture of or "Made-Rite" fittings. Write for complete details today and you will receive man prompt attantion.

Order Furnace Fittings from "Made-Rite"

NO JOB can be better than the fittings you use and no fittings can be better than ours. We've always made a conscientious effort to supply the finest fittings and get them out to our customers with a minimum of time and trouble.

You'll find that dealing with us will be a pleasant and profitable experience. We have a complete line of fittings and accessories to meet your every need and we're sure you'll agree that one order will lead to many more.

Wholesale jobbing inquiries respectfully in-vited and will receive our usual prompt attention.



10th & Monroe St. Newport, Ky.



it's WARM-MAGIC

Gas-fired 20,000 BTU vented Wall Warmolator for homes. offices, motels, apartments, etc. Fits between 2x4 studs on 16-

inch centers without furring or special framing. Unusual standard features include 3-way heat control, 100% safety pilot. Approved for all gases.



FOR REMODELING JOBS TOO!

It's easy to install the handsome new Warmolator 20 in older houses, Write for complete information and plan sheets telling how to do it.

WILLIAMS RADIATOR CO. 1821 Flower St., Glendale 1, Calif. Warmolator

WHITNEY- JENSEN PRODUCTS 38 YEARS EXPERIENCE

No. 455

ANGLE IRON COMBINATION

Consists of No. 4 Shear. No. 50 Notcher, No. 51 Bender

SHEARS . NOTCHES . BENDS

Capacity All angles thru 2" x 2" x 1/4"





No. 52 BENDER

Capacity 1/2" Rounds 1/2" Flats 4" x 2" x 2" Angles write for Catalog 16-48

METAL TOOL COMPANY ROCKFORD, ILL.

Nationalization

(From page 77)

he present rate of consumption. Others could very well be in trouble for ore supplies within 10 years. Let us hope that the influence we are now attempting in Europe will be felt before too many of our natural resources are depleted.

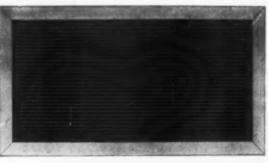
One possible supply of sufficient iron ore would be Minnesota Taconite. This mineral, however, is a meager iron content. Its processing and refinement will add materially to the permanent cost of steel on a commercial basis. Its development would require a large city to house the workers in the cold Taconite areas of Minnesota. The only known undeveloped rich iron ore body in the United States is around the Adirondack region of New York. The deposit is not extensive and is over 1000 feet deep, requiring expensive development and costly workings. In spite of the difficulties involved in extracting this ore, two steel companies, Jones & Laughlin and Republic, have recently announced that they are going to increase production in the Adirondack region. The ore that is found in this territory must be crushed until it is about the size of sand and then the iron is extracted by the use of magnets. This iron must be fused into chunks before it can be used. There is no known substitute in this country for the depleting rich iron ore of the Great Lakes region.

One of the major steel mills has for some time obtained iron ore from Cuban and Chilean ore deposits. bringing their iron ore into Sparrows Point, Md., which

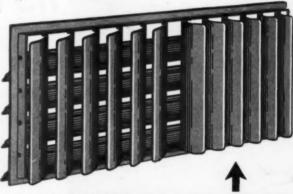
PROFITABLE and Grilles Sell Registers

A-J offers you a complete line, designed right to please more customers, priced right to enable you to compete at a profit. Every A-J air outlet is sturdily constructed for longer wear and superior operation, attractively styled to harmonize with any architectural design.

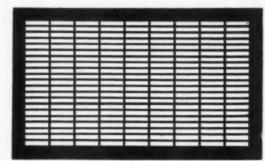
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A-J DOOR GRILLE Vbars prevent steel frames and aluminum cores for strength and lightdoors, walls or partitions.
A-J Door Grille No.
70-B illustraat



A-I AIR DIFFUSER Single or double styles; fully adjustable; louvers held in place by our tested screw feature. A.J Double Diffuser illustrated above.



A-J STAMPED GRILLES Available in designs, sizes and finishes suitable for any installation. Design B illustrated at the left.



A-J MANUFACTURING COMPANY

2119 WASHINGTON ST.

KANSAS CITY 8, MO.



NEW GREAT NATIONAL GAS-FIRED UNIT HEATERS

The big 1947-48 news in gas-fired unit heaters was the new Great National line. Now that line has been improved with four basic engineering advances, and enlarged to include new models, new sizes, and new styles.

The response to Great National's 1947-48 line proved what we had suspected: that there was a real need for a line of superbly-designed, well-engineered heaters. The 1948 Great National heaters are now far out in front-easily the quietest, most trouble-free, and most economical heaters of their kind on the market.

Write for the name of your nearest Great National dealer. Your worries about gas-fired heating will end the day he calls on you.





DUCT TYPE



BLOWER TYPE

All three models available in four sizes: 100,000; 135,000; 200,000 and 270,000 BTU per hour. All styles available in both cast iron with 1% chromium, and in sheet metal.

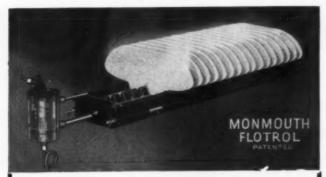




Great National Air Conditioning Co. 2146 North Harwood, Dallas, Texas

"Weathercrafters to the Nation"





Humidifiers are a popular item with home owners right now — more and more people recognize that proper humidification is essential to healthful heating. For top performance and long dependable service, use Monmouth Flotrol or Micro-Feed models

All Monmouth Humidifiers are now equipped with brand new design plates, improved in efficiency and durability. We also make gas-operated Humidity Conditioners for all radiator jobs. Details on request.

THE CLEVELAND HUMIDIFIER CO. 7802 Wade Park Ave., Cleveland 3, Ohio

MONMOUTH HUMIDIFIERS

is on a tidewater. Other steel mills and large manufacturers, looking into the future, are considering Atlantic or Gulf Coast locations. They contemplate foreign imported iron ore, as our deposits deplete. Venezuela, Chile, Cuba, Mexico, and Brazil have good deposits. Brazilian deposits are heavy, rich and close to the surface, affording ideal operations, however, they are 300 miles inland, requiring railroad and other heavy investment, which is a gamble with changing South American government policies.

The Steel Story

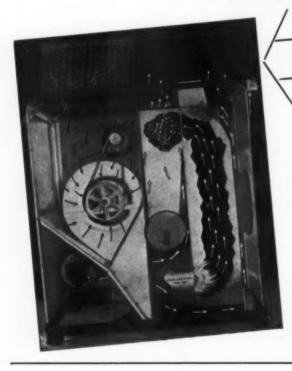
The steel industry has a good story to tell if it would only do so. Professor Sumner H. Slichter of Harvard recently pointed out that American industry today is producing 10 per cent more goods and services than the Brookings Institution recently estimated it would be able to produce by 1950. Increases of 1947 over 1946 gave the oil and gas industry over .5 million more tons, railroads 1 million, jobbers or distributors of steel 1 million, construction 1.25 million, and automobiles 2.5 million more tons.

During the first nine months of last year we shipped more than \$93 million worth of freight cars and farm and industrial machinery on direct exports and lend lease to Russia alone.

Industrial production is up 75 per cent above 1939. We are producing more than three times as many freight cars per month as before the war. The automobile industry produced approximately five million units in 1947, a rate only exceeded once in its history, 1929. The production of cooking stoves and ranges is up 38 per cent over last year. Other industrial pro-

COMPLETE CUSTOMER SATISFACTION! when you install TJERNLUND QUICK HEAT

PERFECTED WINTER AIR CONDITIONING



HERE'S THE INSIDE STORY!

Satisfied customers build sales. It's particularly true in this field where purchases may run into hundreds of dollars and poorly installed jobs or unreliable equipment can prove costly to your reputation and subsequent business opportunities.

Take a look at this cutaway view of Quick-Heat—it shows a modern, highly efficient heating plant in operation. The air is drawn through the filters and forced around the entire heating unit including the "counterflow" heat extracting flues. This results in complete air wipeage of all heating surfaces and clean, comfortable heat for many years.

The Tjernlund line will meet your needs for any installation . . . investigate today. We make them to satisfy.

TJERNLUND MANUFACTURING CO.

2140 Kasota Ave.,

St. Paul 8, Minn.

Is your cut-off time too high?



• Whatever the job—rounds, squares, tubing or odd shapes—the Wells No. 8 Metal Cutting Band Saw will hold your cutoff time to a minimum. For production or general utility this saw has the speed, accuracy and versatility to pay for itself in sayings. The wet cutting system is an economical extra that makes possible higher cutting speeds and lower operating costs. See your Wells Saw dealer or write for full details.

Specifications

CAPACITY: Rounds	8"	dia.
Rectangular	8" x	16"
With Special Guides	.5" x	24"
SPEEDS, Selective	per	min.
MOTOR:	1/2	H.P.
WEIGHT Approximate	750	lhe



Capacity 12" x 16", rectangular, 12¾" O. rounds. It features an automatic cutting cycle and controlled blade pressure.



Wells

Products by Wells are Practical

METAL CUTTING BAND SAWS

1818 WILSON AVE., THREE RIVERS, MIC

Get to know-

CHASE

THRU-WALL Copper FLASHING

(3-Way Bond!)

GET the full story about this improved copper flashing with the unique, binding, saw-tooth corrugations.

Advantages:

- 1 A 3-way bond flashing that is priced economically.
- 2 When you install Chase Thru-Wall Copper Flashing, you offer the best pay no more.
- 3 Easily bent by sheet metal contractor.
- 4 Available through 22 Chase warehouses and through distributors.
- 5 Supplied in 6' lengths, resulting in economical installation costs.



Mail Coupon to Dept. AA98

SEND FOR FREE LITERATURE

Please forward complimentary literature about Chase Thru-Wall Copper Flashing.

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Waterbury 91, Connecticut

ALBANYT ATLANTA BALTIMORE BOSTON CHICAGO CINCINNATI CLEVELAND DETROIT HOUSTON'I INDIANAPOLIS KANSAS CITY, MO. LOS ANGELES MILWAUKEE MINNEAPOLIS NEWARK NEW ORLEANS NEW YORK PHILADELPHIA PITTSBURGH

PROVIDENCE ROCHESTER† SAN FRANCISCO SEATTLE ST. LOUIS WATERBURY
(†Indicates Sales Offices Only)



Nothing means a Lot to a FLUE PIPE

NOTHING BUT AIR...air space between the inner and outer pipes of METALBESTOS gas vent and flue pipe, creating a hot stack to the top of the run. And what's more, this air space keeps the outer pipe cool by providing the most effective insulation available.

From Coast-to-Coast gas appliance installers have discovered that METALBESTOS meets ALL the venting requirements of modern gas heating equipment.



EFFICIENT — With a hot stack the entire length of the run, burnt gases are exhausted with maximum efficiency because they cannot cool as they rise. Even from a cold start, dripping of condensed gases is eliminated.



SAFE — The air space provided by double-pipe construction eliminates any fire hazard by maintaining the temperature of surrounding combustible material below 160° Fahrenheit.



DURABLE — Sturdy all-metal design provides extra rigidity, reduces damage and breakage to an absolute minimum.



EASY TO INSTALL — Round and oval METALBESTOS, in 3 ft., 5 ft., and 10 ft. lengths, with a complete line of fittings, is easily and quickly erected under any conditions.

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Write TODAY for our
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WILLIAMS-WALLACE CO. 160 Hooper Street San Francisco 7, Calif.

METALBESTOS
GAS VENT AND FLUE



YOU GET ONLY THE BEST WITH METALBESTOS

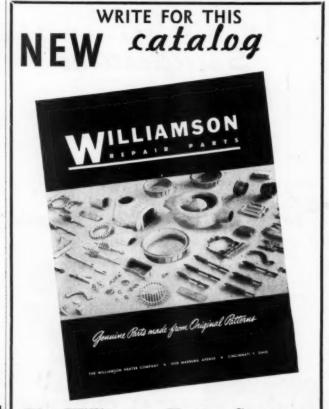
duction is likewise at record heights. All this expanded production is being supported by the steel industry providing the basic steel required for an economy involving 60 million jobs. What's wrong with that? Not enough? Then let us imagine we had 20 per cent more.

Other Troubles Would Arise

A rise in the capacity of the steel industry, giving automobile manufacturers, for instance, more steel, would quickly reveal other bottlenecks of production. Automobile makers with plenty of steel would quickly run short of lead for batteries, copper for wires, and tin for 6 million automobiles a year and Detroit would not get enough railroad cars to carry them away.

The smooth running, high output we have been witnessing this year is the best anti-inflation medicine that can be prescribed for this nation. It would be foolish to discard it to satisfy the whims of theorists and experimenters.

American industry is forever cognizant of public welfare and generally speaking, plants throughout the nation are working and striving for a better American standard of living. It has helped build the most prosperous country on the face of this earth and has always solved its own problems. Contrast this with Nationalization in England. Government intervention in the steel business and steel being the most important basic commodity, could easily mean complete control of industry. Let us avoid costly government participation in business and industry. Let us maintain our free competitive enterprise system, the system that has shown the world how to produce, and how to live.



The Williamson Heater Company 4558 Marburg Ave. Cincinnati 9, Ohio

Riverside





MAKES STANDING "S" CLIPS, TOO!

In the New 36" Size!

ANNOUNCES

Makes a perfect "S" clip up to 36" in length with one simple operation.

Average operator can turn out over 400 clips per hour.

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ee as RIVERSIDE MACHINERY CO.

MINNESOTA

For your modern home owners



MANUFACTURED BY

BRENNER

FOND DU LAC

WISCONSIN

"SILENT" STEEL WELD OIL BURNING Winter Air Conditioning Unit

It is pretty well conceded today that no home is REALLY modern unless it is headed by an up-to-date unit for your discriminating clients who desire winter cir-conditioning turnace. Illustrated here is just the unit for your discriminating clients who desire just the unit for your discriminating clients who desire clean, caretree automatic winter air-conditioning.

The "Silent" Oil Burning Furnace has been especial.

The design of the provide the maximum amount of the limit. The "Silent" Oil Burning Furnace has been especial. It designed to provide the maximum amount of unit with adjustable speed form heat quickly and economically. It leatures an and canacity, and easily assembled combustion unusually quiet blower unit with adjustable speed chamber and burner. Developed by rears of engineering comfort.

Silent" offers the utmost in heating comfort.

Please write today for more information. 275-gallon, 14-gauge fuel oil tanks available with units.



A Black & Decker Electric "HOLGUN" is an easy drill to handle, weighs only three pounds, measures only 6¾" overall. Yet, this compact tool has abundant power for continuous drilling that saves time in all kinds of heating, piping and air conditioning jobs.

Drives twist drills up to 1/4"... wood augers up to 1/2"... small wire brushes for cleaning and burnishing...

B & D Hole Saws for cutting clean, round holes up to 11/8" diameter in any material a hacksaw will cut. Ideal for working in hard-to-reach places. Requires less muscle to operate. Smooth housings, with famous "Pistol Grip and Trigger Switch," fit naturally into either hand.



Black & Decker Electric "5 CRUGUN5" are perfect team-mates for these drills to speed up many sheet metal assembly operations. Shaped just like the HOLGUN. Insure greater accuracy and uniformity with minimum operator fatigue. For full

information on HOLGUNS, SCRUGUNS and many other Portable Electric Tools, see your nearby Black & Decker Distributor. Write for free catalog to: The Black & Decker Mfg. Co., 682 Pennsylvania Ave., Towson 4, Maryland.

*Trade Mark Reg. U. S. Pat. Off.



Ondol

(From page 87)

is done sufficient heat and comfort can be maintained throughout the night.

Room air temperatures of 55 to 65 F are considered sufficient, and are obtained in cold weather, but the heated spaces are quite comfortable due to the radiant effect. The comfort of a person is a matter of clothing, activity, air temperature of the space occupied, and mean radiation temperature of the floor, ceiling and walls of the enclosure. Dr. Yaglou at Harvard University has found that North Americans are comfortable under conditions produced by any of the following sets of temperatures:

Air 71 F and mean radiant temperature 71 F Air 63 F and mean radiant temperature 79 F Air 59 F and mean radiant temperature 85 F

The Westinghouse Research Laboratory has found North Americans to be comfortable by radiant heating with an air temperature of 68 F and a mean radiant temperature of 72 F. L. J. Fowler and Arthur H. Barker report air temperatures of 45 to 50 F with a mean radiant temperature of 75 F as comfortable and in accord with English practice.

Charles Darwin makes note of the factor of acclimatization in his voyage of the Beagle in 1883 when he visited Tierra del Fuego. He found the naked Fuegians streaming with perspiration at the outskirts of his camp fire, while the Englishmen, seated close by the fire found it difficult to keep warm, even though well clothed

While the Korean home has poorly constructed walls

JOHNSON

Highest temperatures without forced air blast

No. 502 Soldering Furnace

\$15.50

F.O.B. Factory
ORDER TODAY



This fast, efficient and economical furnace is equipped with two powerful JOHNSON burners. Each is equipped with shut-off valve and pilot light. Designed for heating soldering coppers up to 12 pounds per pair. Also for heat treating, case hardening, and tempering carbon steel tools and small metal parts. Firebrick lined. Shelf in rear of firebox forms a rest for soldering coppers and protects points. Curved hood forces return blast over top of work. Firebox opening $4\frac{1}{2}$ " x 3".

Write for FREE Catalog of JOHNSON Bench and Soldering Furnaces, Torches and Blowers.

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SERVICE

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our story!

y OU just don't get to be the largest firm in ANY field unless you're set up to provide customers with the utmost in service and quality.

That's the way it's been with us at Northwestern. We know how much time and money can be wasted on a torn-down heating plant if the parts aren't readily obtainable, and we've made it a positive point to always, under any circumstances, fill the smallest order completely, quickly and correctly.

Chances are you're already familiar with Northwestern's code of service and are one of our many satisfied clients. Just in case you're not though, we'll welcome the opportunity to prove to you that "Service is our story!"

Send us a trial order today . . . then sit back and let us prove our point.

NORTHWESTERN STOVE REPAIR COMPANY

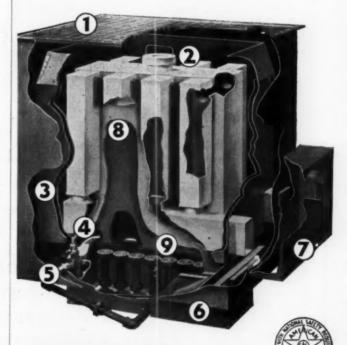
662 West Roosevelt Road

Chicago, Illinois

YOU CAN **Build**A Profitable Business

WITH Cozy GAS FLOOR FURNACES

Wherever gas is available Cozy FLOOR FURNACE DEALERS are sell-ing thousands of units per month! (Also manufactured for L-P gases). If you are not getting your share of this profitable, fast turn-over business it is your own fault. Get started NOW!



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FLOOR FURNACES

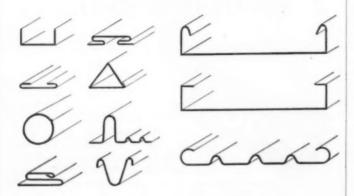
Offer Superior
You Features

As the result of 20 years of satisfactory performance, builders and home owners are asking for Cozy! New dealers and jobbers are being added NOW. Your territory may be open.

WRITE OR WIRE FOR DETAILS

ADVANCE FURNACE COMPANY 2300 EAST DOUGLAS, WICHITA, KANSAS

ROLL FORMING MACHINES AND ROLLER DIES



Also Pittsburgh Lock Machines, Pipe and Elbow, Beading, Turning Machines and all other Sheet Metal Working Machinery. Your inquiries invited.

MAPLEWOOD MACHINERY CO.

2634 FULLERTON AVE.

CHICAGO 47, ILLINOIS

and windows, the windows of the heated spaces are small and few. Glass or a translucent rice paper is used. Sometimes an inner window or screen of rice paper is installed, which cuts down the heat loss. Wall spaces are frequently covered with storage closets, which in effect are double walls, still further reducing heat loss. Unheated spaces are usually provided with large glass windows or doors on one side, and the houses so situated whenever possible that the large glass exposure is southern. In this manner considerable benefit is obtained from the sun's rays.

The ceilings are low and insulated with rice straw. In the case of grass roofs, the grass averages eight inches in thickness. Ceilings are also plastered, providing a dead air space in the gables. Where the roofs are tile, they are laid in earth on sheathing covered with at least an inch of straw or wood shavings. These well insulated roofs and ceilings, together with the warm 85 F floor directly opposite, form a large portion of the radiation surface of the room. The resultant mean radiant temperature of the space is about 65 to 70 F in zero weather. This together with an air temperature of 55 to 65 F gives a comfort condition somewhat equivalent to the British standard, but below that of the United States.

Outside temperatures go below zero, and temperatures of 10 to 20 F are at times sustained for many hours in the vicinity of Seoul. Many homes are inadequately and poorly constructed, and fuel so expensive, that these comfort conditions are not available to a great multitude of the people. Yet they survive, and go about their daily tasks with health and vigor. Acclimatization or the adaptability of the human body to its





GREATER DEALER PROFITS!

- **★** LOWER COST TO YOU . . . production line assembly.
- * PACKAGED UNIT .*. no set up required.
- * EASILY SERVICED . . . all standard parts used.

Can be delivered to average basement completely assembled. Where necessary canopy and burner can be removed in a matter of minutes reducing length to 4 feet.

HEAVY STEEL BOTTOM eliminates cementing.



SHIPPED COMPLETE WITH: Gun Type Oil Burner (Underwriters approved). 12" Blower (with motor). Stainless Steel Comb. Chamber. Standard Size Filter. Automatic Drip Humidifier. Automatic Draft Regulator. Thermostat, Stack Switch. Comb. Fan & Limit Control.

SPECIFICATIONS:

Length overall 62 in Width 24 in BTU Cap. (at bonnet) 100,000 Shipping Weight 525 lbs.

Manufactured by

STANDARD HEATING EQUIPMENT CO.

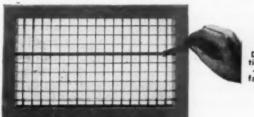
Waterloo, Iowa





Setting High Standards High Velocity Outlets

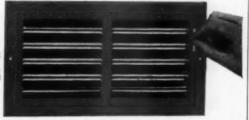
The Stewart line of high velocity outlets, scoopaires, wall and baseboard registers, known for quality construction and efficient service, offers you better diffusion and simpler adjustments for air-conditioning heating and ventilating systems. Standard types, and sizes available for immediate delivery. Send for Catalogue No. 48. Special sizes produced to your specifications.



Style DDH Double Direc-tional 2 Banks

Style DDH Stewart high velocity outlet with "All-Way-Selective-Air-Throw" produced by means of a removable key which can adjust any bar at various angles without affecting the setting of any other bar. Horizontal face bars and vertical bars in rear, are both adjustable for any combination of air direction desired.

Style 94 Wall or Ceiling Register Multiple Damper Lever Regulated



Style 94 is designed for wall or ceiling use, with horizontal face bars which are down deflecting. The rear bank of Style 94 Register serves to regulate the air supply and to deflect air into the outlet. Lever operated multivalves control the degree of opening.

Send for literature and prompt quotation on your requirements.



No Rust-No Corrosion No Painting

with Plastipitch* Protected Metal



of Plastipitch Protected Metal for industrial, railroad and farm buildings.

For roofing and siding, Koppers takes preformed commercial-quality steel sheets -corrugated, crimped and flat-and coats them on both sides with Plastipitch. This tough, corrosion-resistant Pitch Com-pound adheres tenaciously to metal no matter how high or low the atmospheric temperature may go. So you have all the advantages of steel—plus long-lasting protection against rust, corrosion, salt air, weather and corrosive industrial atmos-

Koppers Plastipitch Protected Metal is priced right; it's easy to sell . . . easy to erect. And it's easy to obtain, because warehouse stocks are available from Approved Distributors in major trading areas. Write or to the nearest District to Koppers -Office shown below-for our Engineering Manual on Plastipitch Protected Metal.

KOPPERS COMPANY, INC. · Pittsburgh 19, Pa.



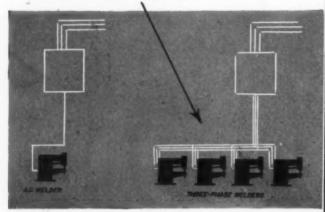
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DISTRICT OFFICES: PITTSBURGH: Koppers Building-NEW YORK: Empire State Building—PROVIDENCE: 178 Massasoit Ave., E. Providence 14, R.I.
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want to get

4 times as much welder capacity

on your same power distribution facilities?





Mighty "Three-Phase" is pointing out to Mr. Widget how he can install four times more resistance welding load without adding to his plant power distribution facilities. It's simple ... all he does is install the revolutionary Sciaky "THREE-PHASE" welders! "THREE-PHASE"

is an achievement in power efficiency that compensates for the high intermittent loads encountered with most resistance welding jobs. It actually allows him to do the same welding job with only ¾ the current required by an ordinary A.C. welder!

Further, he gets a balanced load on all three phases of his supply. And his power supplier is happy because the machines operate on better than 80% power factor. He's happy because he can get Sciaky "THREE-PHASE" welders in big and little sizes—in spot, seam or projection models.

How Mr. Widgel became a "Man of Success" is lucidly told in this little booklet. A copy is yours for the asking—just fill in and mail the coupon below

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Sciaky Bros., Inc. 4915 W. 67th St., Chicago	AA
I'd like to know more abo	out Mr. Widget and "THREE PHASE" use send me your free booklet.
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Firm	
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City	T Ptt-

environment is doubtless a consideration in the ability of the individual to survive the vicissitudes of the climate.

In the typical Korean home as shown, it is to be noted that the cooking fireplace cannot be used in the summertime, as the warm floor associated with it would be objectionable. Cooking is done in warm weather on a charcoal or wood brazier in the kitchen or out in the court.

The ducts and heated floor construction of the Ondol are very interesting. The floor is made of slabs of a granite stone, rough cut, about 12 in. by 18 to 24 in. long, and about 2 in. thick, supported on rows of stone or brick forming the smoke flues. They are all laid in mud or clay mortar. Over the rough stone slabs is a layer of beaten clay, worked to a smooth flat surface. Over this are placed two or three layers of wood pulp newspaper, then two layers of Korean rice paper, and finally a finishing layer of heavy oiled rice paper. A vegetable oil is used. This is the finished floor, tight and smooth, through which flue gases will not escape unless the clay structure is shrunk, cracked and warped by overheating. This floor is walked upon, but not with shoes. The Korean, as well as his foreign guest, removes his shoes at the porch or steps to the house, and walks over these floors in his stocking or bare feet.

The Ondol system is evidence of the degree of technical ingenuity of the people in developing a combined heating and cooking system which in its simplicity is economical in operation, easily constructed from native materials, and provides adequate comfort and convenience for everyday living.

• BLOWERS

for
Air Conditioning Furnace Manufacturers



The New Bishop & Babcock
Air Conditioning
Blower Assembly
Type "AC"—Design 2

The New Bishop & Babcock
Blower Wheel
For Air Conditioning
Furnace Blowers

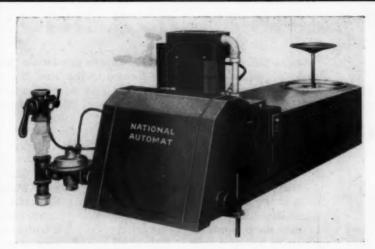




The New Bishop & Babcock
All Stamped
Housing Assembly
and Component Parts

Write for Bulletin No. 115

The BISHOP & BABCOCK Mtg. Co.



ANNOUNCING THE NATIONAL AUTOMAT

Twin Fuel Conversion Burner

Comfort and Economy of Gas—The Protection of Oil

Developed by the MIDWEST RESEARCH INSTITUTE and the GAS SERVICE COMPANY, of Kansas City, Missouri, and manufactured under license agreement. Constructed to meet Underwriters and A. G. A. Requirements.

Now you can offer a solution to gas shortage worries in the winter—but still offer all the comforts of gas. The National Automat provides oil heat automatically in times when gas may be in short supply! It is being nationally accepted—nationally approved—as the ideal burner for use in areas where heavy fuel demands so often cause gas shortages in cold weather. The National Automat can be installed easily, at amazingly low costs.

PREPARE FOR WINTER NOW!

How It Works . . .

The National Automat burns gas until the outside temperature drops to 20 degrees or less (depending on the local Gas Company requirements) at which time the outside thermostat automatically kicks it over to oil; as soon as the outside thermostat goes above 20 degrees the burner automatically switches back to the gas cycle again.

Nearly every Gas Company that prohibits gas furnace or conversion burner installations will allow this burner to be installed.

National Automat-Is Permanent

Be prepared to satisfy the demand during the coming heating season.

For complete information write today.

National Engineering & Manufacturing Co.
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the Crestrol temperature regulation system

- CONTINUOUS AIR CIRCULATION
- MODULATING DELIVERY TEMPERATURES
- FOR ALL FUELS
- . LOW IN COST
- . EASY TO INSTALL
- . A NEW CONCEPT OF COMFORT

This amazing new system is easily added to any existing control system. Through a simultaneous regulation of both the room temperature and the temperature of the air supply for the room, warmed air is constantly circulated without blasts of heat, and without cool "off" periods.

There is no other item in the warm air field that will bring you so much profit from one hour of installation time.

In addition our consumer plan does the selling for you. You, of course, are interested in perfect heating comfort for your customers, and the most profitable sales program yet offered so, please, today . . .

Crest Industries

Chicago 1, Illinois

75 EAST WACKER DRIVE

WRITE FOR COMPLETE DETAILS!







did this entire job quickly, accurately, and economically. It can't be excelled for cutting through any kind of material, including 10-gauge sheet metal. It's fast, safe, efficient, easy to handle!

RCS TOOL SALES CORPORATION

P. O. BOX 1434

JOLIET, ILL.

Fuel Oil Pumps

(From page 92)

stage pump can be used if the intake pressure is not so low that bubbles will be formed in the line. If the intake pressure is extremely low and bubbles would form, these must be removed from the oil and so the two stage pump is required.

Flow and Pressure Distribution

The distribution of the flow and the pressure in various parts of the circuits are indicated in the drawings. The total quantity of fuel delivered by the pump is at the rate Q. The rate of flow through the nozzle is at the rate q. The hydraulic grade lines shown indicate the pressure in the intake lines only. A hydraulic grade line in a pipe of uniform diameter always slopes downward in the direction of flow.

The pump intake in the single stage, single line circuit (Fig. 2) must be under positive pressure. In this system the single line from the tank carries liquid at the rate q, which is less than the rate Q thus resulting in a relatively slight pressure drop in the intake line.

In the single stage, two line circuit (Fig. 3) the hydraulic grade line falls below the pump inlet indicating a negative pressure (vacuum) at the inlet. The rate of flow in the intake line is the full delivery of the pump, Q, causing a greater pressure drop per foot of pipe than in the single stage, single line circuit. The quantity returned through the second line is Q-q.

Finally, in the two stage, two line circuit (Fig. 4)

STANDFORATED BASEBOARD REGISTERS

NOW IN PRODUCTION

QUICK DELIVERY!

2-Piece Construction with Removable Face of "BEND-EZY" Design. Metallic Finish.



Immediate Delivery on All Standard Sizes



SPECIFICATIONS:

Duct Size 10" x 8" 12" x 8" 12" x 9" Base Ext. 21/4" 21/4"

PERFORATED METALS FOR EVERY INDUSTRIAL USE

We also manufacture the MIRRO-GLO LINE of Bathroom Medicine Cabinets. WRITE FOR COMPLETE INFORMATION, PRICE LIST.



PERFORATING CO

UNIPACK ... Since 1929



DEPENDABLE RUGGED QUIET

> Note that the cap bearing has been removed to show the bronze bearing with ring oiler.

Quiet As A Cat's Purr

Introduced in 1929, the Unipack has since been giving satisfying service in thousands of homes. Nineteen years and still going strong—for today the ever present demand for this dependable blower with rugged construction and quieter operation continues. Proof enough, we think, of its preference. Better yet, find out for yourself how superior and satisfactory the Unipack really is



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American Machine Products Co. MARSHALLTOWN, IOWA



FLANGED



Especially designed to fit Air Conditioning and Steam or Hot Water Furnaces for Thatcher, American Radiator, Kaustine, International, Koven, Kewanee, etc.

SAVE 25% TO 50% BY BUYING DIRECT . . .

OUIET AUTOMATIC BURNER CORP.

Manufacturers and Engineers NEWARK 4, N. J.

WHITNEY PUNCHES

No. 4B PUNCH



Length 8½ inches. Capacity ¼-inch through 16 gauge. Deep Throat — 2 inches. Weight—3 pounds. Punches and Dies—1/16" to 9/32" by 64ths.

No. 6 PUNCH



Length—2814 inches, Capacity — 34 - inch hole through 3/16-inch iron; especially adapted for button punching or templet work. Punches and

No. 91 PUNCH



CAPACITY

1/2-inch hole through 3/4-inch iron; 3/16-inch iron; 2-inch hole through 3/16-inch iron; 1/2-inch iron. Depth throat, 5 inches. Weight, 82 lbs.

We have tools for every purpose needed by Sheet Metal Con-Ask your Jobber

No. 1 PUNCH





th — 23 inches. Ca-y — 5-16-inch hole gh ¼ - inch iron. hes and dies in sizes to ½-inch by

CHANNEL IRON PUNCH



Companion to No. 2 Punch. Every part of the two punches Interchange-able, including punches and dies. Capacity—1/4-inch hole through 3/4-inch

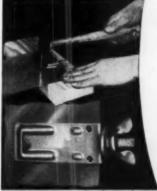


KWIK-WAY DAM REGULATOR SETS



Most Easily and Quickly Attachable Sets on the Marker

STURDY . RATTLE-PROOF NO ANVIL REQUIRED IDENTICAL 5/16" RETRACTABLE BEARINGS



Simply slip the bearing over the edge of the damper at the bearing line. Lay on any firm surface and strike one solid hammer blow. The prong pierces the damper and is clinched securely in place by the heavily ribbed underside construction of bearing. Fastening is permanent-ly solid, rattle-proof. Identical bearings with retractable bolt make easier installation of regular or splitter dampers in round or square ducts.

LIST PRICES



No. 70 Set......\$0.30 No. 77 Set..... 0.40 FOR LARGE DAMPERS

No. 503/8 Set \$0.60 No. 803/8 Set 0.60

See your jobber or write for literature.

& COOLEY MANUFACTURING CO. HOLLAND MICHIGAN

In Canada: Hart & Cooley Mfg. Co., Fort Erie, N. Ontario



★ National Expansion program of General Automatic Steps Fast.

14 DEALERSHIPS

Now Open!!

MINNESOTA

3 openings, not including twin cities

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5 openings, not including Chicago

PENNSYLVANIA

3 openings, not including Philadelphia

MASSACHUSETTS

3 openings, not including Boston

Write, wire or phone General Oil Burner Corporation, 2300 Sinclair Lane, Baltimore 13-WOlfe 4500.

"85" Budget Package

A warm air unit for small, basementless homes. Complete with burner and all parts ready to install. 85,000 B.T.U. Other models up to 200,000 B.T.U. Highway models also



Model

General Oil Burner Corp., 2300 Sinclair Lane, Balto. 13, Md.

the liquid surface in the tank is far below the pump inlet. The result is that the hydraulic grade line also falls well below the pump inlet and a considerable negative pressure exists in the area. The rate of flow in the intake line is Q and in the return line, Q-q. Any air released in the oil due to low pressure at the first stage inlet is removed from the system to the return line between stages, thus assuring solid oil at the intake of the second stage. The pressure at the inlet to the second stage is always atmospheric or above.

Brown— Sales Manual

(From page 81)

Or sell them an automatic humidifier, or an electric damper control.

Sell them something—and go back later on and sell them that complete modernization job you should have sold them in the first place. Keep selling. If they have a thermostat—sell them a clock thermostat. If they have a blower—sell them replacement filters regularly. Don't get the idea that you have lost a prospect when you have made a sale. Actually, you have gained a potential steady customer.

The production boys learned a lot during the war, and we in sales are going to have to get up steam in order to keep up with them. Good modern merchandise rolls off assembly lines. The market is wide open. Let's get sales minded—let's get to work. The time is NOW!



GRAND RAPIDS de luxe FURNACE CLEANER

Large air volume and high velocity give the Grand Rapids Furnace Cleaner maximum recovery capacity. This means faster, more efficient cleaning for every type of furnace or boiler . . . plus more jobs and larger profits for you. Standard groups of attachments available with each Furnace Cleaner are designed to reach into and clean every part of the heating plant.

Service your furnace cleaning jobs with a Grand Rapids DeLuxe Furnace Cleaner. It is sturdy, long wearing and constructed to do a thorough cleaning job under the roughest conditions. Write today for information.

DOYLE VACUUM CLEANER CO.

227 Stevens St., S.W.

Grand Rapids 7, Michigan

available.









New! HEXDALL SEAM OPENER

(Potent Pending)

The handiest tool you can put in your box! Especially designed to save time and trouble in opening Pittsburg Locks. You will be amazed with the speed and ease of opening seams. Priced at \$1.85 — you'd want it if it cost fifteen dollars! Order from your jobber, or if jobber has no supply, order direct from us.

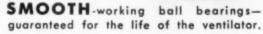
A. M. HEXDALL CO. MORRIS, ILLINOIS

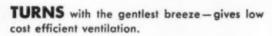
Manufacturers of Sheet Metal Specialties

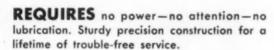


FOR BEST RESULTS - INSTALL . . .









Western Rotary Turbine Ventilators are available in all sizes for industrial, commercial and institutional jobs. Write for complete catalog and engineering data.

"Always on the job - never on the payroll"

WESTERN ENGINEERING & MFG. CO.

1726 E. Washington Blvd. Los Angeles 21, Calif. 510 N Dearborn St. Chicago 10, III.

Underwriters

(From page 94)

(b) In systems of over 15,000 cubic feet per minute capacity, serving areas where large numbers of people congregate or areas having valuable contents particularly subject to smoke damage, except when system is located on the same floor that it serves, it is recommended that approved smoke dampers be installed in the main supply duct and main return duct. Such dampers should be arranged to close automatically when the system is not in operation and also by the operation of the smoke detecting apparatus or by the manual emergency motor stop.

(c) Dampers provided in ducts used solely for exhaust of air to the outside, shall be installed in such a way that they will not interfere with the flow of air in the main duct. No dampers are required in a system serving only one floor and used only for exhaust of air to the outside. Dampers should be designed to close in the direction of air flow. Where direction of exhaust air flow is upward, sub-ducts at least 22 inches in length may be carried up inside the main duct from each inlet, in lieu of dampers.

Add the following new paragraph:

135(d). Aluminum ducts which pass through fire resistive floors, unless incased as specified in paragraph 124, shall have approved automatic fire dampers at the floors.

(To page 190)



Steel Furnaces
Cast Iron
Furnaces

Winter Air

Oil Burners Humidifiers

Blowers

No good PREMIER Dealer is going to be eaten up by unfair competition. Dealers who push our line are safeguarded by our Exclusive Franchise which assures full territory protection. This Exclusive Franchise also qualifies the dealer for our Nine Point Plan of factory cooperation, designed to promote his sales and profits. In this way, PREMIER supports the Independent Furnace Dealer, and helps him STAY independent!

PREMIER FURNACE COMPANY

DOWAGIAC, MICHIGAN

Add Extra Easy Profits

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CIRCULATAIRE

THE FORCED AIR UNIT for GRAVITY TYPE WARM AIR FURNACES



SAVES FUEL • QUIET • ECONOMICAL • AUTOMATIC EASILY INSTALLED • AVAILABLE NOW

Improve the efficiency of thousands of Gravity type furnaces and add to your profits by installing CIRCULATAIRE. No duct work required - no baffles - no wiring! (Average Installation Time Less Than Two Hours.) Write for complete information.

Proof of Dealer Acceptance—68% of our June orders were REPEAT ORDERS

"Circulataire" Div., Corlett-Turner Co.
1001 S. KOSTNER AVE. CHICAGO, 24, ILL.



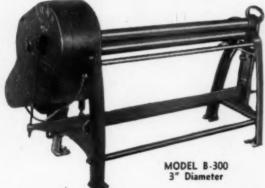
ROLLED TO YOUR SPECIFICATIONS

Made to your specific specifications—accurately rolled in every dimension for all fan installations. Also used for reinforcing tanks, smoke stacks, and thousands of other uses. Channels, flat bars, tees, special shapes, and all types of sheet metal fabricating to order.

Write for standard sizes and discounts.

NATIONAL METAL FABRICATORS 2136 S. Sawyer Ave. Chicago 23, Illinois

LOWN Slip Roll Forming Machines FIT YOUR JOB!



If you want MORE PRODUCTION and ECO-NOMICAL OPERATION, use LOWN Slip Roll Forming Machines.

Our machines are designed for sturdiness and ease of operation to provide peak productivity.

Rugged - Rigid - Attractive - Prompt Deliveries.

The LOWN Slip Roll Forming Machines are built in a range of sizes from which you can choose the exact unit for your requirements, with roll diameters 2" through 6".

San Angelo Foundry & Machine Co.

San Angelo, Texas E. Upton & SFE Tracks
Distributors in Most Principal Cities — Write for Bulletins.



IT TAKES THE LOAD OFF THE FAN!

Aluminum louvers open fully, permitting capacity fan operation. New heavy reinforcement strip adds strength and long life to the louvers, assures quiet operation and perfect counterbalance, prevents rattling. Deep shroud protects shutter from high winds. Tie-rod, brackets and bearings inside frame, not exposed to weather. Special finish resists corrosion. Many other features.

Write for New Air-Flo Catalog 43-C

Illustrations and details of the complete Air-Flo line.

AIR CONDITIONING PRODUCTS CO. 2340 W. LAFAYETTE BLVD. DETROIT 16, MICH



Libert Hi-Speed SHEAR

- SIMPLIFIES
 Maintenance
- SPEEDS
 Production
- SAVES Manpower

The Libert has amply proved its advantages by turning out top production—shearing flat or formed sheet metal, internal or external, plain or irregular shapes rapidly, accurately, cleanly!

Equally effective in maintenance work, *Libert* is cutting costs to rock bottom. Edges are smooth, need no finishing. Unskilled operators produce accurate work at once.

Sizes up to 60-in. throat, 10-gauge capacity.

LIBERT MACHINE COMPANY
Green Bay, Wisconsin

KITCHEN NTILATION n the ceiling where it belongs! THE CLIPPER BLOWER mounts in the ceiling-above the stove-instantly trapping heat, grease and odors as they rise and expels them outdoors. Extra efficient—extra quiet-extra long life. Guaranteed 5 years because an exclusive, patented partition isolates the motor from the greasy air stream—it runs clean and cool indefinitely. Write for the Clipper Dealer Plan Trade-Wind Motorfans, Inc. 5703 S. Main St., Los Angeles 37, Calif.

173. In systems installed in buildings equipped with automatic sprinklers or manual or automatic fire alarm systems, it is recommended that the necessary devices and connections be installed to automatically shut down the fans when the sprinkler or fire alarm systems operate.

Paragraph 173. Revised to read as follows:

173. In systems installed in buildings equipped with automatic sprinklers or manual or automatic fire alarm systems, it is recommended that the necessary devices and connections be installed to automatically shut down the fans when the sprinkler or fire alarm systems operate, except where the air conditioning or ventilating systems are adapted to remove smoke as recommended in paragraph 103.

191. Mechanical refrigeration shall be installed in accordance with the Safety Code for Mechanical Refrigeration (A.S.A.—B9-1939).

Amend paragraph 191 by striking out date "1939" at end of paragraph.

311. Such ducts shall be constructed entirely of noncombustible material equivalent in structural strength and durability to the following:

(a) DUCTS NOT ENCLOSED IN PARTITIONS:

(To page 192)



A

THIS LABEL IS YOUR ASSURANCE OF THE BEST FURNACE PIPE AND ELBOWS OBTAINABLE.

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THE BETTER DEALERS IN THE MID-WESTERN AND ROCKY MOUNTAIN STATES INSIST UPON SUPERIOR FURNACE PIPE AND ELBOWS. MANUFACTURED ONLY BY—

SUPERIOR PRODUCTS CO.

606-10 South 14th St., Omaha 2, Nebraska



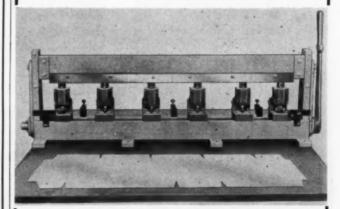
DOWN TO EARTH FACTS ABOUT A MERCOID SENSATHERM

It maintains a home in ideal comfort at any desired temperature. It is a masterpiece in mechanical precision, design and appearance. It operates on a variation of ½° above or below the point set, it is a corrosion-proof mercury switch contact equipped control. It performs perfectly for years without any servicing attention.

ANYTHING MORE YOU CAN ASK FOR IN A THERMOSTAT?

MADE BY THE MERCOID CORPORATION 4235 BELMONT AVENUE, CHICAGO 41, ILLINOIS

MULTI-NOTCHER



Sheet Metal Shop Operators will appreciate the cost-saving advantages of the new MULTI-NOTCHER which will neatly cut six accurately located notches with one pull of the handle in steel or aluminum sheet up to 20 gage in thickness. Layout operations are made easy by self-aligned dies which are readily moveable to the correct position according to the built-in scale. Standard Machines are available for 36-in. and 48-in. wide sheet; other models for sheet up to 120-in. wide. Dies are available for 30-deg. V-notches, square notches, Pittsburgh notches and others. For more information contact your distributor or write us.

Fallsington Mfg. Co. Fallsington, Bucks Co., Pa.

PERFORMANCE PLUS!

ATH-A-NOR
Furnaces and Parts

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Performance is the yardstick for measuring the efficiency of any heating plant, and those that will operate year after year with little or no attention are the ones which will return you the most profit.

You're sure of top drawer performance when you install ATH-A-NOR Furnaces and parts exclusively. Over fifty years of furnace manufacturing experience guarantee you home heating plants with performance ratings and lasting qualities to satisfy the most critical clients. Investigate now . . . write for literature.

MAY-FIEBEGER COMPANY

Manufacturers of Quality Heating Equipment for Over Fifty Years.

Newark

Ohio

ROUND DUCTS

Minimum Thickness of Galvanized Minimum Weight of Tin Iron 30 U.S. Gauge IC (107 lb.)

IX (135 lb.) RECTANGULAR DUCTS

> Minimum Thickness of Galvanized

28 U.S. Gauge

Width, Inches Less than 14

Diameter.

Inches

Less than 12

12 or more

Iron 28 U.S. Gauge 14 or more

Width.

Inches

14 or less

Over 14

26 U.S. Gauge

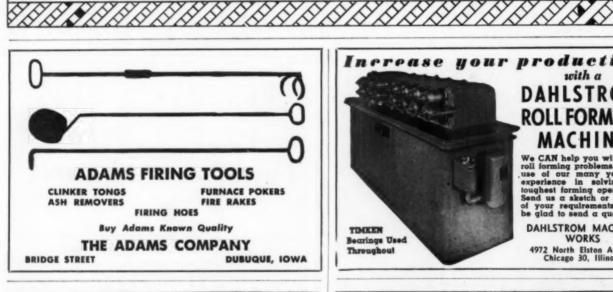
(b) DUCTS ENCLOSED IN PARTITIONS:

Minimum Thickness of Galvanized Minimum Weight of Tin Iron 30 U.S. Gauge IC (107 lb.) IX (135 lb.) 28 U.S. Gauge PART II

Paragraph 311. Revise paragraphs 311-(a) and (b) by adding a new column giving minimum metal gauges for aluminum ducts.

(a) DUCTS NOT ENCLOSED IN PARTITIONS:

Installed Faster... E-Z-ON Damper Regulators ORDER FROM YOUR JOBBER . .





with a DAHLSTROM ROLL FORMING

We CAN help you with your roll forming problems. Make use of our many years of experience in solving the toughest forming operations. Send us a sketch or sample of your requirements, we'll be glad to send a quotation.

DAHLSTROM MACHINE WORKS

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New and improved "EX" Fans are now available in standard sizes from No. 15 to No. 80 and from 200 to 30,000 CFM Capacity with pressures up to 15" W.G. These fans are commonly used for exhaust problems to handle dust, fumes, shavings, etc., but can be adapted for forced draft service.

service.

"EX" Fans are furnished in all standard arrangements of the N.A.F.M. The design is such that it can be easily modified to suit special assemblies, thus "EX" Fans are ideal for resale purposes, as part of factory assembled units.

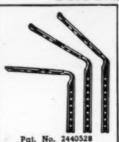
Write us about your problems. Send for Bulletin No. EX-41

BAYLEY BLOWER COMPANY

1817 South 66th Street

Milwaukee, Wis.

IMPROVED!



No. 12 SHANK

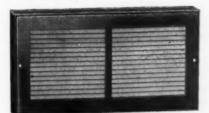
331/3% STRONGER

IMPROVEMENT IS APPLIED TO No. 15-SQUARE, No. 12-PITCH, AND No. 25-1/2 PITCH.

SOLD THRU LEADING JOBBERS EYERYWHERE

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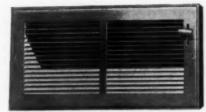
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No. 27 Flange Intake



No. 28 Flush Intake



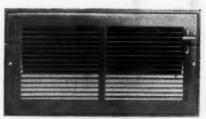
No. 24 Baseboard Register

REGISTERS and GRILLES by

SUPERIOR CONSTRUCTION MIDCO EVERLASTING BEAUTY

Write today for price list

MIDCO REGISTER CORP. 1059 Grand Ave. St. Paul, Minn.



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INSIDE

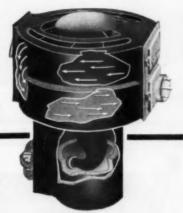
BEFORE YOU DECIDE

. . and You Will Look to Radiation

- * MORE HEAT **EFFICIENCY**
- **MORE FOR** YOUR HEAT-ING DOLLAR

Styled in attractive cabinets for nearly every size home

"Performance alone sells a Radiation Furnace."



DEALERS:

Write at once and learn why Radiation is the most outstanding buy today. Attractive territories for dealers and manufacturers agents.

Today's Most Outstanding Furnace

CORPORATION FURNAGE

Benton Harbor, Michigan

EXCLUSIVE PRODUCERS

Of The Famous NO. 65 S AND NO. 42 CHROME FINISH PAINTS 4800 HI-HEAT ALUMINUM PAINT

R. M. GOLDEN LUSTRE GOLD PAINT Industrial & Automotive Finishes Lacquer Thinners * Bronzing Vehicles Manufactured by

ILLINOIS BRONZE POWDER CO. INC.

Dept. AA, 2015-29 S. Clark St., Chicago 16



ALL SHADES

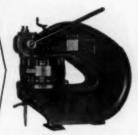
of BRONZE **POWDERS** MADE TO ORDER!



IN PUNCHES TOO. THE ONE HOLER IS A THING OF THE PAST.

CHECK THESE FACTS!

- Simplicity of Operation
- Throat Depth Up to 24 Inches
- Will Handle Wide Range of Materials Capacity Up to 10 Gauge Mild Steel
- Punches and Dies of Highest Quality Tool Steels
- Special Shapes & Sixes of Punches and Dies Available

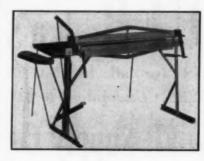


WRITE FOR FOLDER

ROTEX PUNCH COMPANY

4726 EAST 12 STREET . OAKLAND 1, CALIFORNIA

HARRIS BRAKES



Portable - Sturdy All-Purpose **Brakes**

The 4' Brake weighs 175 lbs. Can be ready to transport by removing 4-46 nuts in 5 minutes. Folds into a bundle 5"-x 11" x 6' Essily handles 26 ga. Iron. Has 5lip Off Feature. 2-Tool Benches. Indispensable if you work on the lob.
THE BOBBIE 1 ft. BRAKE Handles 26 ga., is for Small Fast Jobs as Boxes — Outlets, etc., where production and ease of operation are important.

A. R. HARRIS

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ROUND DUCTS

Diameter, Inches Less than 12	Minimum Wt. of Tin IC (107 lb.) IX (135 lb.)	Minimum Thickness Galv. Iron U. S. Gauge 30 28	Minimum Thickness Aluminum B & S Gauge 26 26
12 or more		JLAR DUCTS	20
			Minimum
		Minimum	Thickness
		Thickness	Aluminum
Width,		Galv. Iron	B & S
Inches		U.S. Gauge	Gauge

14 or more

£	or	more			26	3
	(b)	DUCTS	ENCLOSED	IN	PARTITIONS:	

Minimanna

Minimum
Thickness
Aluminum
B & S
Gauge

		Millimum	THICKHESS
		Thickness	Aluminum
Width,	Minimum	Galv. Iron	B & S
Inches	Wt. of Tin	U.S. Gauge	Gauge
14 or less	IC (107 lb.)	30	26
Over 14	IX (135 lb.)	28	26

332. Warm air furnaces equipped with a fan to circulate the air, which are fed by a stoker in which the stoker mechanism is automatically controlled from a house thermostat, shall be provided with an automatic over-run control to start the fan when the air in the furnace bonnet, or at the beginning of the main supply

EFFICIENT HEAT without CLINKER NUISANCE in the NEW Majestic STOKER FURNACE

28

This smartly designed, rugged unit is tops in home-heating service, convenience, and economy. Special crown radial fins boost heat output. Inner can permits clean, easy clinker disposal. Any domestic stoker fits either side. It's a Majestic climax to

38 years' experience in heating.

Less than 14

- Made of HEAVY DUTY STEEL

26

For GRAVITY OF FORCED AIR SYSTEMS

THE Majestic (0. 1094 Erie St. Huntington, Ind.





Conduvectors for More Heat



Chicago Steel Bending Brake



DREIS & KRUMP MANUFACTURING CO. 7404 LOOMIS BLVD. CHICAGO 36, ILL.

REPAIR PARTS for all FURNACES **BOILERS, STOVES** • Guaranteed to FIT

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St. Louis, Mo.





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one hand to operate

4301 N. Harlem Ave.

"BIG SHOT

PORTABLE SPOT WELDER

21/2-3 KVA the NEW STREAMLINED NOSE now reaches into the tight corners the practical - hot - light - fast PORTABLE SPOTTER you have been asking us for — lo, these many years — to take RIGHT TO THE JOB — ANY TIME — ANY PLACE — ANY POSITION Simply rest the top point on the spot to be welded—squeeze handle down hard—lift the little switch with the little finger—momentarily—until red hot fusion is made, then re-

lease and move to the next spot.

Air-cooled and ventilated. 22 lbs—10 ft. 3 wire attached lead-in—COMPLETELY INSULATED—welds mild steel, stainless, terne plate, magnesium, galv. iron, also (with special tips) aluminum; just like your big shop spotter—up to ½" total thickness. Tongs in picture 3½" reach. Overall length 15". Additional equipment—6" and 12" tongs with center point, special alloy, adjustable tips mounted. Center OFF-center and special metal (for aluminum) tips available—immediate delivery from your dealer. For emergencies, intermittent duty—special jobs in or away from the shop; 110 or 220 volt, 60 cycle AC potential—fully guaranteed.

the other hand FREE-to Hold

Useful in tack welding-to eliminate jigs, etc., also in silver soldering.

Chicago 33, III.

THE A-C-DEVICES COMPANY, National Distributor

ORNAMENTS



STAMPINGS & SPINNINGS

Zinc Ornaments Available From Stock. Copper, brass, bronze, aluminum and stainless steel ornaments made up promptly.

If you don't have catalog K, send for it NOW.

MILLER & DOING

65 YORK STREET

BROOKLYN, N. Y.

A compact, self-

contained unit

easily and

cheaply in-

stalled. Write

for details

now, Dept. 9.

INDUSTRY'S VENTILATING **PROBLEMS** SOLVED!

No belts to slip. Direct connected. Sets up on the roof out of the way of everything.

THE GALLAHER CO.

Owatonna, Minn.

Forged Hand Tools

Chisels, punches, drills, screw drivers, nippers and numerous other hand tools . . . quality built for long service. Sold by leading jobbers.



DAMASCUS STEEL PRODUCTS CORP. ROCKFORD, ILLINOIS





"CRARYS" RAIN WATER **CUT OFFS**

Made in all Standard Conductor Pipe Sizes. Plain Round and Corrugated Round.

Write for Prices and Name of your nearest Jobber.

GALVAN MANUFACTURING CO. New Albany, Indiana

Heating Sheet Metal



Air Conditioning Supplies

Furnace pipe, adjustable elbows and Fittings

ALSO: Complete line sheet metal hand tools

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1600-1700 San Fernando Road, Los Angeles 41, Cal. ****************************** MANUFACTURERS OF

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also conductor pipe, eaves trough, drip edge, rake strip, etc. THOR METAL PRODUCTS CO., INC.

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IS EASY TO USE!



BUY FROM YOUR JOBBER

Just put a little TINIT on any metal and apply heat-TINIT flows quickly into joints, bends and corners! Cleans, tins and

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fluxes stainless steel, black iron, hard-drawn copper and all metals in one quick operation. Sold by refrigeration service, tinning supply, automotive and other jobbers for 19 years.

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ALMAR EASY SLITTER

FOR USE WITH BRAKE OR BENCH Speed up your work-without an 8' or 10' Square Shear

The Rotary action of cutters produces a neat, accurate clean edge.





PRICE-COMPLETE Almar Easy Slitter

with cutting head & track Brake Type —
Brake Type —
Brake Type —
Brake Type —
F.O.B.—Chicago, Ill.

WARD MACHINERY COMPANY

561 W. WASHINGTON BLVD.

CHICAGO 6, ILLINOIS



duct at a point not affected by radiated heat reaches a temperature not higher than 250° F. after the stoker and fan (in its normal operation) have been shut down as a result of a satisfied thermostat.

Add a new sentence at the end of paragraph 332 to read "There shall be no manual disconnect switch in the fan electrical circuit."

Add sentence to para 351 "There shall be no manual disconnect switch in the fan electrical circuit."

Add the following new paragraph:

368. In the case of a two-family residence, the public hall or public stairway shall not be used as a plenum.

Note: The word "plenum" as used in paragraph 368 means an air compartment or chamber to which one or more ducts are connected and which forms part of the air distribution system.

Don't Wait for Winter Clean Those Furnaces Now!



Cold winds will soon be blowing and heating units again in use. Time is getting short to clean furnaces that have been neglected all summer. Cleaning reveals need for replacements and repairs which can be made before fires are started, thus eliminating costly breakdowns and causing discomfort and greater expense. expense.

The Super Red Streak Furnace Cleaner enables you to build up a profitable furnace cleaning business which leads you to sales of plants and parts. Your customer pays your bill with what you save him out

National Super Service Company, Inc. 1944 N. 13th St., Toledo 2, Ohio

National Super Service Company of Canada Vancouver, B. C.

Type and Size for Every Need





For efficiently controlling light and medium dampers in heating, ventilating and air conditioning systems, specify Parker-Kalon Damper Controls. The line includes all types and sizes, at a range of prices to fit the needs of any job. Parker-Kalon Corp., 200 Varick Street, New York.

PARKER-KALON damper controls



REPAIR PARTS FOR ANY FURNACE, BOILER OR STOVE

Complete Line of Sundries and Supplies

IMMEDIATE DELIVERY

OMAHA STOVE REPAIR WORKS

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to see

the Wysong and Miles Line of

SHEET METAL MACHINERY at the third annual

HACKETT MACHINERY SHOW

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Char-Gale Mfg. Co	175 194 130 153 156 136 60 197 174 121 * 137 8 189 186 199 183 160 192 195	Maurey Mfg. Co. May-Flebeger Co. May-Flebeger Co. Mayflower Air Conditioners, Inc. McDonnell & Miller, Inc. McDonnell & Miller, Inc. McLarty Systems Mercoid Corp., The Messer, J. H. Meyer & Bro. Co., F. Mever Furnace Co. Milco Register Corp. Millor & Doing Milton Equipment Co. Milwaukee Gas Specialty Co. Minneapolls-Honeywell Regulator Co. Morrison Products, Inc. Morrison Railway Supply Corp. Morrison Steel Products, Inc. Mut. Vernon Furnace & Mfc. Co. Mueller Furnace Co., L. J. Murray Co., The National Engr. & Mfg. Co. National Gas Equipment Co., Inc. National Heafer Co.	191 • 198 191 • 170 193 195 195 195 195 195 195 195 195	Union Mfg. Co U. S. Air Conditioning Corp. U. S. Machine Corp. U. S. Machine Corp. United States Register Company United States Steel Corp	166 29 50 121 121 121 121 121 131 133 175 188 55 24 13
Char-Gale Mfg. Co	175 194 130 153 156 60 197 174 121 137 8 186 19 186 19 187 189 186 19 183 160 195	Maurey Mfg. Co. May-Flebeger Co. Mayflower Alt Conditioners, Inc. McDonnell & Miller, Inc. McDonnell & Miller, Inc. McLarty Systems Mercold Corp. The Messer, J. H. Meyer & Bro. Co. F. Mever Furnace Co. Mildeo Register Corp. Milton Equioment Co. Milton Equioment Co. Milton Equioment Co. Minneapolia-Honeywell Regulator Co. Inside Back C. Morrison Products, Inc. Morrison Railway Supply Corp. Morrison Steel Products, Inc. Mt. Vernon Furnace & Mfc. Co. Muller Furnace Co. L. J. Murray Co., The. National Engr. & Mfg. Co. National Gas Equipment Co., Inc. National Heater Co. National Metal Fabricators.	191 198 198 191 170 77 193 195 195 198 43 200 61 198 188 188 188 188 188 188 18	Union Mfg. Co U. S. Air Conditioning Corp. U. S. Machine Corp. U. S. Machine Corp. United States Register Company United States Steel Corp	166 29 50 121 121 121 121 165 196 84 139 133 175 188 55 24 133
Char-Gale Mfg. Co	175 194 130 153 156 60 197 174 121 137 8 189 189 189 180 192 195	Maurey Mfg. Co. May-Flebger Co. Mayflower Air Conditioners, Inc. McDonnell & Miller, Inc. McDonnell & Miller, Inc. McLarty Systems Mercold Corp. The Messer, J. H. Meyer & Bro. Co., F. Mever Furnace Co. Milco Register Corp. Milton Equipment Co. Milwaukee Gas Specialty Co. Milwaukee Gas Specialty Co. Minneapolla-Honeywell Regulator Co. Mrison Products, Inc. Morrison Products, Inc. Morrison Steel Products, Inc. Myt. Vernon Furnace & Mfg. Co. Muller Furnace Co., L. J. Murray Co., The. National Gas Equipment Co., Inc. National Heater Co. National Heater Co. National Metal Fabricators National Super Service Co.	191 198 199 170 77 193 188 43 128 61 198 188 188 188 188 188 188 18	Union Mfg. Co U. S. Air Conditioning Corp. U. S. Machine Corp. U. S. Machine Corp. United States Register Company United States Steel Corp	166 29 50 121 121 121 121 121 131 133 175 188 55 24 13 133 175 188 55
Char-Gale Mfg. Co	175 194 130 153 156 60 197 174 121 137 8 186 19 188 199 189 186 199 183 160 195 66 158	Maurey Mfg. Co. May-Flebeger Co. May-Flebeger Co. Mayflower Air Conditioners, Inc. McDonnell & Miller, Inc. McDonnell & Miller, Inc. McLarty Systems Mercold Corp. The Messer, J. H. Meyer & Bro. Co., F. Mever Furnace Co. Mildon Register Corp. Mildon Equipment Co. Mildon Equipment Co. Minneapolis-Honeywell Regulator Co. Inside Back Co. Morrison Products, Inc. Morrison Railway Supply Corp. Morrison Steel Products, Inc. Mut. Vernon Furnace & Mfc. Co. Mueller Furnace Co., L. J. Murray Co., The National Gas Equipment Co., Inc. National Heater Co. National Metal Fabricators National Products Mfg. Co.	191 198 198 197 170 170 171 195 188 43 128 61 198 188 188 188 188 188 188 18	Union Mfg. Co U. S. Air Conditioning Corp. U. S. Machine Corp. U. S. Machine Corp. United States Register Company. United States Steel Corp	166 29 50 121 121 121 121 121 131 133 175 188 55 24 13
Char-Gale Mfg. Co	175 194 130 153 156 60 197 174 121 137 8 189 189 180 199 180 199 180 192 22	May-Fiebeger Co. May-Fiebeger Co. May-Fiebeger Co. Mayflower Air Conditioners, Inc. McDonnell & Miller, Inc. McDonnell & Miller, Inc. McLarty Systems Mercold Corp. The Messer, J. H. Meyer & Bro. Co., F. Mever Furnace Co. Midco Register Corp. Millon Equioment Co. Millon Equioment Co. Millon Equioment Co. Millon Equioment Co. Minneapolla-Honeywell Regulator Co. Inside Back Co. Morrison Products, Inc. Morrison Railway Supply Corp. Morrison Railway Supply Corp. Mt. Vernon Furnace & Mfc. Co. Muller Furnace Co., L. J. Murray Co., The. National Fngr. & Mfg. Co. National Gas Equipment Co., Inc. National Heater Co. National Heater Co. Nobel's Products Mfg. Co. Nobel's Products Mfg. Co.	191 198 199 170 77 193 188 43 128 61 198 188 186 183 165 189	Union Mfg. Co U. S. Air Conditioning Corp. U. S. Machine Corp. U. S. Machine Corp. United States Register Company. United States Steel Corp	166 29 50 121 121 121 121 121 165 184 133 175 185 185 172
Char-Gale Mfg. Co	175 194 130 153 156 136 60 197 174 121 137 8 189 186 199 186 199 186 199 186 199 186 199 186 196 196 196 196 196 196 196 196 196 19	Maurey Mfg. Co. May-Flebeger Co. McLarty Systems Mercoid Corp. The Messer. J. H. Meyer & Bro. Co. F. Meyer & Bro. Co. Midco Register Corp. Milton Equipment Co. Milton Equipment Co. Milton Equipment Co. Mineapolls-Honeywell Regulator Co. Inside Back Co. Morrison Products, Inc. Morrison Railway Supply Corp. Morrison Steel Products, Inc. Mut. Vernon Furnace & Mfc. Co. Mueller Furnace Co. L. Murray Co. The. Myray Co. National Bage Equipment Co. National Heater Co. National Heater Co. National Metal Pabricators. National Super Service Co. Nobel's Products Mfg. Co. Nobel's Products Mfg. Co. Nobel's Products Mfg. Co. Nobel's Products Mfg. Co.	191 198 198 199 170 77 193 195 183 43 195 188 188 188 188 188 188 188 18	Union Mfg. Co U. S. Air Conditioning Corp. U. S. Machine Corp. U. S. Machine Corp. U. S. Machine Corp. U. S. Machine Corp. United States Register Company United States Steel Corp	166 29 50 121 121 121 121 121 131 133 175 188 55 24 13 133 175 188 55
Char-Gale Mfg. Co	175 194 130 153 156 60 197 174 121 137 8 189 189 180 199 180 199 180 195 66 195 66 195 66 195 66 195 66 195 66 195 66 195 66 196 196 196 196 197 197 197 197 197 197 197 197 197 197	May-Flebeger Co. May-Flebeger Co. Mayflower Air Conditioners, Inc. McDonnell & Miller, Inc. McDonnell & Miller, Inc. McLarty Systems Mercold Corp. The Messer, J. H. Meyer & Bro. Co. F. Mever Furnace Co. Midco Register Corp. Miller & Doing Millon Equipment Co. Milwaukee Gas Specialiv Co. Minneapolia-Honeywell Regulator Co. Inside Back Co. Morrison Products. Inc. Morrison Railway Supply Corp. Morrison Reallway Supply Corp. Morrison Steel Products. Inc. Mt. Vernon Furnace & Mfc. Co. Muller Furnace Co., L. J. Murray Co., The National Gas Equipment Co., Inc. National Heater Co. National Metal Fabricators. National Metal Fabricators. National Super Service Co. Nobel's Products Mfg. Co.	191 198 198 191 170 177 195 188 43 128 61 198 118 166 183 165 189 166 189 189 189 189 189 189 189 189	Union Mfg. Co U. S. Air Conditioning Corp. U. S. Machine Corp. U. S. Machine Corp. United States Register Company United States Steel Corp	166 29 50 121 121 121 121 121 165 184 133 175 185 185 172
Char-Gale Mfg. Co	175 194 130 153 156 136 60 197 174 121 * 137 8 189 186 199 183 160 189 189 189 189 189 189 189 189 189 189	May-Flebeger Co. May-Flebeger Co. May-Flebeger Co. Mayflower Air Conditioners, Inc. McDonnell & Miller, Inc. McLarty Systems Mercold Corp., The Messer, J. H. Meyer & Bro. Co., F. Mever Furnace Co. Milco Register Corp. Milco Register Co. Milco Register Corp. Milco Register Co. Milco Register Co. Milco Register Co. Milco Register Corp. Morrison Regulator Morrison Raliway Supply Corp. Morrison Raliway Supply Corp. Morrison Steel Products. Inc. Myt. Vernon Furnace & Mfg. Co. Muller Furnace Co. L. J. Murray Co. The. National Fagr. & Mfg. Co. National Heater Co. National Mytal Fabricators. National Mytal Fabricators. National Super Service Co. Nobel's Products Mfg. Co. Nobel's Foundries Co. City Foundries Co. Niagara Furnace Div. of the Forest City Foundries Co.	191 198 198 199 170 77 193 195 183 43 195 188 188 188 188 188 188 188 18	Union Mfg. Co U. S. Air Conditioning Corp. U. S. Machine Corp. U. S. Machine Corp. United States Register Company United States Steel Corp	166 29 50 121 121 121 121 121 121 121 132 133 175 1188 133 175 172 63 171 176
Char-Gale Mfg. Co	175 194 130 153 156 60 197 174 121 137 8 189 186 19 183 160 192 195 66 158 22 164 47 198 44	May-Flebeger Co. May-Flebeger Co. May-Flebeger Co. Mayflower Air Conditioners, Inc. McDonnell & Miller, Inc. McDonnell & Miller, Inc. McLarty Systems Mercold Corp. The Messer, J. H. Meyer & Bro. Co. F. Mever Furnace Co. Midco Register Corp. Milton Equioment Co. Milton Equioment Co. Milton Equioment Co. Minneapolia-Honeywell Regulator Co. Inside Back Co. Morrison Products, Inc. Morrison Railway Supply Corp. Morrison Steel Products, Inc. Mt. Vernon Furnace & Mfc. Co. Muller Furnace Co. L. J. Murray Co., The. National Gas Equipment Co., Inc. National Heater Co. National Metal Fabricators National Super Service Co. Nobel's Products Mfg. Co. Nobel's Products Mfg. Co. Nobel's Products Mfg. Co. Nobel Troundries Co. Nobel Troundries Co. Nobel Troundries Co. Niggara Machine & Tool Works Northwest Metal Products, Inc.	191 198 198 191 170 170 171 195 188 43 128 61 198 188 188 188 188 188 188 18	Union Mfg. Co U. S. Air Conditioning Corp. U. S. Machine Corp. U. S. Machine Corp. United States Register Company United States Steel Corp	166 29 50 121 121 121 121 121 121 121 132 133 175 1188 133 175 172 63 171 176
Char-Gale Mfg. Co	175 194 130 153 156 136 60 197 174 121 * 137 8 189 186 199 183 160 189 189 189 189 189 189 189 189 189 189	Maurey Mfg. Co. May-Flebger Co. Mayflower Air Conditioners, Inc. McDonnell & Miller, Inc. McDonnell & Miller, Inc. McLarty Systems Mercold Corp. The Messer, J. H. Meyer & Bro. Co., F. Mever Furnace Co. Midco Register Corp. Miller & Doling Milton Equipment Co. Milwaukee Gas Specialty Co. Minneapolla-Honeywell Regulator Co. Inside Back Co. Morrison Products, Inc. Morrison Railway Supply Corp. Morrison Steel Products, Inc. Mt. Vernon Furnace & Mfc. Co. Muller Furnace Co., L. J. Murray Co., The. National Engr. & Mfg. Co. National Heater Co. National Heater Co. National Heater Co. National Super Service Co. Nolson Corp. Herman. Niagara Furnace Div. of the Forest City Foundries Co. Nolson Corp. Herman. Niagara Machine & Tool Works. Northwest Metal Products, Inc. Northwestern Stove Repair Co.	191 198 198 191 191 195 195 195 188 43 43 43 128 61 198 118 166 183 165 189 196 196 197 198 199 199 199 199 199 199 199	Union Mfg. Co U. S. Air Conditioning Corp. U. S. Machine Corp. U. S. Machine Corp. United States Register Company. United States Steel Corp	166 29 50 121 121 121 121 121 121 121 132 133 175 1188 133 175 172 63 171 176
Char-Gale Mfg. Co	175 194 130 153 156 60 197 174 121 137 8 188 189 186 199 183 160 192 195 66 158 22 195 66 158 44 194	Maurey Mfg. Co. May-Flebger Co. Mayflower Air Conditioners, Inc. McDonnell & Miller, Inc. McDonnell & Miller, Inc. McLarty Systems Mercold Corp. The Messer, J. H. Meyer & Bro. Co., F. Mever Furnace Co. Midco Register Corp. Miller & Doling Milton Equipment Co. Milwaukee Gas Specialty Co. Minneapolla-Honeywell Regulator Co. Inside Back Co. Morrison Products, Inc. Morrison Railway Supply Corp. Morrison Steel Products, Inc. Mt. Vernon Furnace & Mfc. Co. Muller Furnace Co., L. J. Murray Co., The. National Engr. & Mfg. Co. National Heater Co. National Heater Co. National Heater Co. National Super Service Co. Nolson Corp. Herman. Niagara Furnace Div. of the Forest City Foundries Co. Nolson Corp. Herman. Niagara Machine & Tool Works. Northwest Metal Products, Inc. Northwestern Stove Repair Co.	191 198 198 199 170 7 189 195 189 189 189 189 188 188 188 188	Union Mfg. Co U. S. Air Conditioning Corp. U. S. Machine Corp. U. S. Machine Corp. U. S. Machine Corp. U. S. Machine Corp. United States Register Company United States Steel Corp. 28, 64 & United States Steel Export Co 28, 64 & Utility Appliance Corp Universal Air Conditioning Corp. Viking Air Conditioning Corp. Viking Mfg. Co Wagner Elec. Corp Wad Machinery Co Webb Machine & Tool Co Webb Machine & Tool Co Wells Mfg. Co Welster Electric Corp. Western Engrg. Co Westinghouse Electric Corp. Wheling Cornugating Co White Mfg. Co White Mfg. Co White Mfg. Co White Mfg. Co Whitney Mfg. Co Williams Oil-O-Matic Division. Eureka Williams Corp. Williams-Wallace Co Williams-Wallace Co Williams-Wallace Co Williams-Mallace Co	166 29 50 50 121 121 121 121 165 65 133 175 54 24 13 35 175 188 188 172 188 173 174 188 175 176 177 176
Char-Gale Mfg. Co	175 194 130 153 156 60 197 174 121 137 8 189 189 180 199 183 160 192 195 66 158 22 164 47 194 194	May-Flebger Co. May-Flebger Co. May-Flebger Co. Mayflower Air Conditioners, Inc. McDonnell & Miller, Inc. McDonnell & Miller, Inc. McLarty Systems Mercold Corp. The Messer, J. H. Meyer & Bro. Co. F. Mever Furnace Co. Milco Register Corp. Millon Equioment Co. Milwaukee Gas Specialty Co. Milwaukee Gas Specialty Co. Minneapolla-Honeywell Regulator Co. Inside Back Co. Morrison Products, Inc. Morrison Railway Supply Corp. Morrison Railway Supply Corp. Morrison Rilway Supply Corp. Morrison Rilway Supply Corp. Morrison Froducts, Inc. Myt. Vernon Furnace & Mfc. Co. Mueller Furnace Co., L. J. Murray Co., The. National Gas Equipment Co., Inc. National Heater Co. National Heater Co. National Super Service Co. Nohel's Products Mfg. Co. Nelson Corp. Herman Niagara Furnace Div. of the Forest City Foundries Co. Niagara Machine & Tool Works Northwest Metal Products, Inc. Northwest Metal Products, Inc.	191 198 198 191 170 77 193 188 43 128 61 198 118 166 183 165 189 196 196 197 198 199 199 199 199 199 199 199	Union Mfg. Co U. S. Air Conditioning Corp. U. S. Machine Corp. U. S. Machine Corp. U. S. Machine Corp. U. S. Machine Corp. United States Register Company United States Steel Corp. 28, 64 & United States Steel Export Co 28, 64 & Utility Appliance Corp Universal Air Conditioning Corp. Viking Air Conditioning Corp. Viking Mfg. Co Wagner Elec. Corp Wad Machinery Co Webb Machine & Tool Co Webb Machine & Tool Co Wells Mfg. Co Welster Electric Corp. Western Engrg. Co Westinghouse Electric Corp. Wheling Cornugating Co White Mfg. Co White Mfg. Co White Mfg. Co White Mfg. Co Whitney Mfg. Co Williams Oil-O-Matic Division. Eureka Williams Corp. Williams-Wallace Co Williams-Wallace Co Williams-Wallace Co Williams-Mallace Co	166 29 50 50 121 121 121 121 196 84 133 175 188 175 188 185 172 63 171 176 176 177 176 177 176 177 177
Char-Gale Mfg. Co	175 194 130 153 156 156 197 174 121 137 8 189 186 199 186 199 187 189 186 199 186 199 187 191 197	May-Flebeger Co McLarty Systems Mercold Corp., The Messer, J. H. Meyer & Bro. Co F. Mever Furnace Co Milco Register Corp. Morrison Regulator Co Morrison Products, Inc. Morrison Raliway Supply Corp. Morrison Steel Products, Inc. Murray Co., The National Gas Equipment Co., Inc. National Heater Co. National Heater Co. National Heater Co. National Super Service Co. Nobel's Products Mfg. Co. Nobel's Products Mfg. Co. Nobel's Products Mfg. Co. Nolagara Furnace Div. of the Forest City Foundries Co. Niagara Machine & Tool Works. Northwest Metal Products, Inc. Northwestern Stove Repair Co. Nu-Way Corp. Olsen Mfg. Co., C. A. Omaha Stove Repair Works.	191 198 198 199 170 77 193 195 183 195 183 183 185 188 188 188 188 188 189 199 199	Union Mfg. Co U. S. Air Conditioning Corp. U. S. Machine Corp. United States Register Company United States Steel Export Co 28, 64 & United States Steel Export Co Universal Air Conditioning Co. Viking Air Conditioning Corp. Viking Mfg. Co Wagner Elec. Corp. Ward Machine & Tool Co. Webster Electric Co Webb Machine & Tool Co. Welton Steel Co Wells Mfg. Co Western Engrg. Co Westinghouse Electric Corp. Wheling Cornugating Co. White Mfg. Co Williams Oli-O-Matic Division. Eureka Williams Corp. Williams Radiator Co Williams Wallace Co Williams Wallace Co Williams Radiator Co	166 29 50 50 121 121 121 121 165 65 133 175 54 24 13 35 175 188 188 172 188 173 174 188 175 176 177 176
Char-Gale Mfg. Co	175 194 130 153 156 60 197 174 121 137 8 189 189 189 195 195 195 195 195 194 47 198 447 194 197	May-Fibeger Co. May-Fibeger Co. May-Fibeger Co. Mayflower Air Conditioners, Inc. McDonnell & Miller, Inc. McDonnell & Miller, Inc. McLarty Systems Mercold Corp. The Messer, J. H. Meyer & Bro. Co. F. Mever Furnace Co. Midco Register Corp. Millen & Doling Milton Equipment Co. Milwaukee Gas Specialiv Co. Minneapolia-Honeywell Regulator Co. Inside Back Co. Morrison Products. Inc. Morrison Railway Supply Corp. Miller Furnace Co. Mr. Vernon Furnace & Mfg. Co. National Engr. & Mfg. Co. National Heater Co. National Heater Co. National Heater Co. Norlonal Motal Fabricators National Super Service Co. Nobel's Products Mfg. Co. Nolson Corp. Herman Niagara Furnace Div. of the Forest City Foundries Co. Niagara Machine & Tool Works. Northwest Metal Products, Inc. Northwestern Stove Repair Co. Nu-Way Corp. Olsen Mfg. Co., C. A. Omaha Stove Repair Works Owens-Corning Fiberglas Corp.	191	Union Mfg. Co U. S. Air Conditioning Corp. U. S. Machine Corp. United States Steel Corp. 28, 64 & United States Steel Export Co 28, 64 & United States Steel Export Co 28, 64 & United States Steel Supply Co 28, 64 & United States Steel Supply Co 28, 64 & United States Steel Export Co 28, 64 & United States Steel Export Co 28, 64 & United States Steel Export Co Viking Air Conditioning Corp. Viking Air Conditioning Corp. Viking Mfg. Co Wagner Elec. Corp. Ward Machine & Tool Co Webb Machine & Tool Co Wels Mfg. Co Western Engrg. Co Western Engrg. Co Western Engrg. Co White Mfg. Co Whitney Mfg. Co Whitney Mfg. Co Whitney Mfg. Co Whitney Metal Tool Co Williams Oli-O-Matic Division, Eureka Williams Corp. Williams Radiator Co Williams Wallace Co Williams Halace Co Williams Halace Co Williams Radiator Co Williams Gol., Inc Wilson, Inc Grant Wilson, K. R Wise Furnace Co Wodack Electric Tool Co	166 29 50 50 121 121 121 121 196 84 133 175 188 175 188 185 172 63 171 176 176 177 176 177 176 177 177
Char-Gale Mfg. Co	175 194 130 153 156 60 197 174 121 137 8 188 189 186 199 1883 160 192 195 66 158 22 195 66 158 47 47 41 194	May-Flebger Co. May-Flebger Co. May-Flebger Co. Mayflower Air Conditioners, Inc. McDonnell & Miller, Inc. McDonnell & Miller, Inc. McLarty Systems Mercold Corp. The Messer, J. H. Meyer & Bro. Co. F. Mever Furnace Co. Midco Register Corp. Miller & Doing Milton Equipment Co. Milwaukee Gas Specialty Co. Minneapolla-Honeywell Regulator Co. Inside Back Co. Morrison Products, Inc. Morrison Products, Inc. Morrison Railway Supply Corp. Morrison Steel Products, Inc. Mt. Vernon Furnace & Mfg. Co. Mueller Furnace Co., L. J. Murray Co., The. National Engr. & Mfg. Co. National Heater Co. National Super Service Co. Nelson Corp. Herman. Niagara Furnace Div. of the Forest City Foundries Co. Niagara Machine & Tool Works. Northwest Metal Products, Inc. Northwest Metal Products, Inc. Northwestern Stove Repair Co. Nu-Way Corp. Olsen Mfg. Co. C. A. Omaha Stove Repair Works. Owens-Corning Fiberglas Corp. Pacific Industrial Mfg. Co.	191 198 198 199 170 77 193 195 183 195 183 183 185 188 188 188 188 188 189 199 199	Union Mfg. Co U. S. Air Conditioning Corp. U. S. Machine Corp. United States Steel Corp. 28, 64 & United States Steel Export Co 28, 64 & United States Steel Export Co 28, 64 & United States Steel Supply Co 28, 64 & United States Steel Supply Co 28, 64 & United States Steel Export Co 28, 64 & United States Steel Export Co 28, 64 & United States Steel Export Co Viking Air Conditioning Corp. Viking Air Conditioning Corp. Viking Mfg. Co Wagner Elec. Corp. Ward Machine & Tool Co Webb Machine & Tool Co Wels Mfg. Co Western Engrg. Co Western Engrg. Co Western Engrg. Co White Mfg. Co Whitney Mfg. Co Whitney Mfg. Co Whitney Mfg. Co Whitney Metal Tool Co Williams Oli-O-Matic Division, Eureka Williams Corp. Williams Radiator Co Williams Wallace Co Williams Halace Co Williams Halace Co Williams Radiator Co Williams Gol., Inc Wilson, Inc Grant Wilson, K. R Wise Furnace Co Wodack Electric Tool Co	166 29 121 121 121 121 121 121 121 132 133 133
Char-Gale Mfg. Co	175 194 130 153 156 60 197 174 121 137 8 186 19 186 19 187 189 186 19 183 160 195 66 158 22 164 47 195 195	May-Fiebeger Co. May-Fiebeger Co. May-Fiebeger Co. Mayflower Alt Conditioners, Inc. McDonnell & Miller, Inc. McDonnell & Miller, Inc. McLarty Systems Mercold Corp. The Messer, J. H. Meyer & Bro. Co. F. Mever Furnace Co. Midco Register Corp. Milton Equioment Co. Milton Equioment Co. Milton Equioment Co. Minneapolia-Honeywell Regulator Co. Inside Back Co. Morrison Products, Inc. Morrison Railway Supply Corp. Morrison Rellway Supply Corp. Morrison Steel Products, Inc. Mt. Vernon Furnace & Mfc. Co. Mueller Furnace Co. L. J. Murray Co., The. National Gas Equipment Co., Inc. National Gas Equipment Co., Inc. National Metal Fabricators. National Metal Fabricators. National My Products Mfg. Co. Nobel's Products Mfg. Co. Nobel's Products Mfg. Co. Noblon Corp. Herman. Niavara Furnace Div. of the Forest City Foundries Co. Niagara Machine & Tool Works. Northwest Metal Products, Inc. Northwestern Stove Repair Co. Nu-Way Corp. Olsen Mfg. Co., C. A. Omaha Stove Repair Works. Owens-Corning Fiberglas Corp. Packard Elec. Div., General Motors	191	Union Mfg. Co U. S. Air Conditioning Corp. U. S. Machine Corp. U. S. Machine Corp. U. S. Machine Corp. United States Register Company. United States Steel Corp	166 29 50 120 121 121 121 121 121 121 131 175 188 4 175 188 175 188 177 172 63 171 176 63 171 176 177 178 179 179 179 179 179 179 179 179 179 179
Char-Gale Mfg. Co	175 194 130 153 156 60 197 174 121 * 137 8 189 186 199 183 160 158 44 199 44 194 197 197 197	May-Flebger Co. May-Flebger Co. May-Flebger Co. Mayflower Air Conditioners, Inc. McDonnell & Miller, Inc. McDonnell & Miller, Inc. McLarty Systems Mercold Corp. The Messer, J. H. Meyer & Bro. Co. F. Mever Furnace Co. Midco Register Corp. Miller & Doling Milton Equipment Co. Milwaukee Gas Specialty Co. Minneapolla-Honeywell Regulator Co. Inside Back Co. Morrison Products. Inc. Morrison Railway Supply Corp. Morrison Rel Froducts. Inc. Mt. Vernon Furnace & Mfc. Co. Mueller Furnace Co., L. J. Murray Co., The. National Engr. & Mfg. Co. National Heater Co. National Heater Co. National Heater Co. National Heater Co. Nolson Corp. Herman. Niagara Furnace Div. of the Forest City Foundries Co. Nuagara Machine & Tool Works. Northwest Metal Products, Inc. Northwestern Stove Repair Co. Nu-Way Corp. Olsen Mfg. Co., C. A. Omaha Stove Repair Works Owens-Corping Fiberglas Corp. Pacific Industrial Mfg. Co. Packard Elec. Div., General Motors Corp.	191	Union Mfg. Co U. S. Air Conditioning Corp. U. S. Machine Corp. U. S. Machine Corp. U. S. Machine Corp. United States Register Company. United States Steel Corp. 28, 64 & United States Steel Export Co 28, 64 & United States Steel Supply Co 28, 64 & United States Steel Supply Co 28, 64 & United States Steel Supply Co 28, 64 & Utility Appliance Corp. Universal Air Conditioning Corp. Viking Air Conditioning Corp. Viking Mfg. Co Wagner Elec. Corp. Ward Machiner Co Webb Machine & Tool Co Webb Machine & Tool Co Wells Mfg. Co Western Engrg. Co Western Engrg. Co Western Engrg. Co White Mfg. Co Williams Oll-O-Matic Division. Eureka Williams Corp Williams Radiator Co Williams Hadiar Co Williams Adalace Co Williams Adalace Co Wilson & Co., Inc Wilson K. R. Wise Furnace Co Wodack Electric Tool Co Wolff & Co Benjamin. Wysong & Miles Co 21 &	166 29 50 120 121 121 121 121 121 132 133 133 175 188 55 24 133 175 1176 63 177 176 176 176 176 176 176 176 176 176
Char-Gale Mfg. Co	175 194 130 153 156 60 197 174 121 137 8 186 19 187 189 186 192 195 66 158 22 195 66 158 44 194 197 197 197 197 197 197	May-Flebeger Co. May-Flebeger Co. May-Flebeger Co. Mayflower Alt Conditioners, Inc. McDonnell & Miller, Inc. McDonnell & Miller, Inc. McLarty Systems Mercold Corp. The Messer, J. H. Meyer & Bro. Co. F. Mever Furnace Co. Mildeo Register Corp. Milton Equioment Co. Milwaukee Gas Specialty Co. Milmaepolla-Honeywell Regulator Co. Inside Back Co. Morrison Products, Inc. Morrison Railway Supply Corp. Morrison Register Co. Muller Furnace Co. L. J. Murray Co., The. National Furnace Co., L. National Gas Equipment Co., Inc. National Heater Co. National Metal Fabricators. National Super Service Co. Nobel's Products Mfg. Co. Nobel's Products Mfg. Co. Northwest Metal Products, Inc. Northwest Metal Products, Inc. Northwestern Stove Repair Co. Nu-Way Corp. Olsen Mfg. Co., C. A. Omaha Stove Repair Works. Owens-Corning Fiberglas Corp. Packard Elec. Div., General Motors Corp. Palmer Mfg. Co.	191	Union Mfg. Co U. S. Air Conditioning Corp. U. S. Machine Corp. U. S. Machine Corp. U. S. Machine Corp. United States Register Company. United States Steel Corp. 28, 64 & United States Steel Export Co. 28, 64 & United States Steel Supply Co. 28, 64 & Unitersal Air Conditioning Corp. Viking Afr. Conditioning Corp. Ward Machinery Co. Waterman-Waterbury Co. Webb Machine & Tool Co. Wells Mfg. Co. Western Engrg. Co. White Mfg. Co. Williams Oil-O-Matic Division. Eureka Williams Corp. Williams Radiator Co. Williams Radiator Co. Williams Radiator Co. Williams Mallace Co. Williams Hater Co. 151, 152 & Wilson & Co., Inc. Wilson & Co., Inc. Wilson, Inc., Grant Wilson, Inc., Grant Wilson, K. R. Wise Furnace Co. Wodack Electric Tool Co. Wodack Electric Tool Co. Wolf & Co., Benjamin. Wysong & Miles Co. 21 & XXth Century Htg. & Vent. Co.	166 29 50 101 121 121 121 121 121 14 121 13 13 13 13 13 13 13 13 13 13 13 13 13
Char-Gale Mfg. Co	175 194 130 153 156 60 197 174 121 * 137 8 189 186 199 183 160 158 44 199 44 194 197 197 197	May-Flebeger Co McLarty Systems Mercold Corp., The Messer, J. H. Meyer & Bro. Co F. Mever Furnace Co Milco Register Corp. Milco Register Corp. Milton Equipment Co Milwaukee Gas Specialty Co Minneapolls-Honeywell Regulator Co Inside Back Co Morrison Products, Inc Morrison Railway Supply Corp. Morrison Steel Products, Inc Morrison Steel Products, Inc Murray Co The. Murray Co The. National Gas Equipment Co., Inc National Heater Co National Heater Co National Heater Co National Super Service Co Nobel's Producta Mfg. Co Nobel's Producta Mfg. Co Nobel's Producta Mfg. Co Nobel's Producta Mfg. Co Northwest Metal Products, Inc Northwestern Stove Repair Co Northwestern Stove Repair Co Nu-Way Corp Olsan Mg. Co., C. A Ounaha Stove Repair Works. Owens-Corping Fiberglas Corp. Pacific Industrial Mfg. Co Packard Elec. Div., General Motors Corp., Palmer Mfg. Co	191	Union Mfg. Co U. S. Air Conditioning Corp. U. S. Machine Corp. U. S. Machine Corp. U. S. Machine Corp. United States Register Company. United States Steel Corp. 28, 64 & United States Steel Export Co 28, 64 & United States Steel Supply Co 28, 64 & United States Steel Supply Co 28, 64 & United States Steel Supply Co 28, 64 & Utility Appliance Corp. Universal Air Conditioning Corp. Viking Air Conditioning Corp. Viking Mfg. Co Wagner Elec. Corp. Ward Machiner Co Webb Machine & Tool Co Webb Machine & Tool Co Wells Mfg. Co Western Engrg. Co Western Engrg. Co Western Engrg. Co White Mfg. Co Williams Oll-O-Matic Division. Eureka Williams Corp Williams Radiator Co Williams Hadiar Co Williams Adalace Co Williams Adalace Co Wilson & Co., Inc Wilson K. R. Wise Furnace Co Wodack Electric Tool Co Wolff & Co Benjamin. Wysong & Miles Co 21 &	166 29 50 120 121 121 121 121 121 132 133 133 175 188 55 24 133 175 1176 63 177 176 176 176 176 176 176 176 176 176

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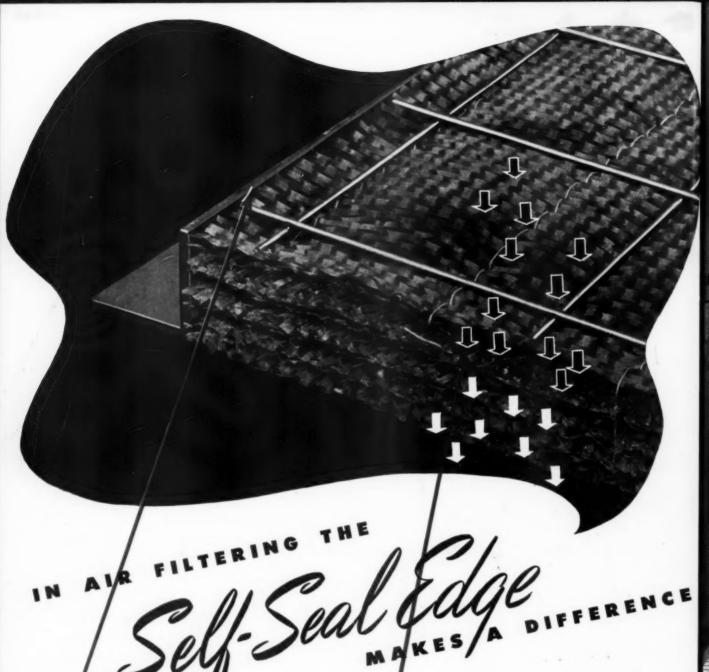
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Such magazines as Saturday Evening Post, Collier's, Better Homes & Gardens, American Home, House and Garden and House Beautiful are being used. In addition, there are counter displays, sales portfolios, direct mail pieces, newspaper advertisements and radio commercials — all designed to help you sell the Plug-In Chronotherm. And when you sell Chronotherm, you sell fuel saving — and save enough fuel to sell more automatic heat. So if you're not ready, get set with a supply of the new Plug-In Chronotherms. Order today from your usual source. You can't lose and you're bound to win! Minneapolis-Honeywell Regulator Company, Minneapolis 8, Minnesota. In Canada: Leaside, Toronto 17, Ontario.

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All circulating air must pass through the filter media, where thousands of tiny baffles cause a turbulent action in the air stream, and effectively scrub out dirt, dust, lint and pollen.

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